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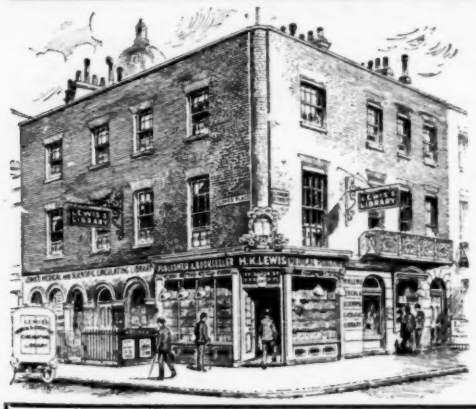

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*Delivered before the Royal Society of Medicine on Nov. 8th*

BY SIR JOHN BLAND-SUTTON, F.R.C.S. ENG.,
CONSULTING SURGEON TO THE MIDDLESEX HOSPITAL.

INDIANS living in the dense forests bordering the section of the Amazon called the Marañon, have acquired notoriety in preparing what are known in England as "shrunk human heads." While on a visit to the Amazon I got some of these curious heads and have been able to examine them critically; I also obtained some facts concerning the Indians. Recently G. M. Dyott made an adventurous journey across Perus to Iquitos. After being treacherously abandoned by his guide on the return journey, he was rescued by some Aguarunas. Dyott, virtually a prisoner for many weeks, won the confidence of the Indians and they helped him to reach Lima. Whilst with the Indians he acquired some knowledge of their language, the secrets of the community, and a first-hand knowledge of their customs. These he described in his book entitled, "The Silent Highways of the Jungle" (1922).

FIG. 1.—Aguaruna boy equipped for accompanying his father in the forest. (*From a photograph by G. M. Dyott.*)

### THE AGUARUNAS.

These Indians are well formed, with coppery skins and long raven-black hair, which is cut into a fringe across the forehead. The men average in height 5½ feet; the women rarely exceed 5 feet. The men are clever hunters, use the blow-gun skilfully, and can hit a monkey, as it jumps from tree to tree, with the poisoned dart. They live on bananas, mandioca, and fruit. They also eat fishes, tortoises, sloths, monkeys, small wild pigs, and birds, especially toucans and parrots. The women are drudges; they collect, prepare, and cook the food. The men hunt and fight; in their hours of ease they amuse themselves by spinning thread from wild cotton, and weave the material for the scanty clothes they wear. In civilised countries human beings wear clothes for decency, protection against weather, and for warmth. With the Aguarunas decency does not count. Their scanty clothes protect them against insects and thorns. When it rains, they take off their clothes, carefully fold them, and use large palm leaves to keep themselves dry. The Indian (Fig. 1) shows well the luxuriant growth of hair. This boy is equipped for accompanying his father in the forest. The quiver, made of bamboo, contains light wooden poisoned darts, slender as knitting needles; the gourd attached to it contains a supply of wild cotton which is used for adjusting the darts to the lumen of the blow-gun. The pointed tip of a dart is smeared with woorali, the South American arrow-poison. A mere scratch of the skin made with the tip of such a dart is quickly fatal, but a moderate quantity of woorali may be swallowed without harm. The flesh of a bird or an animal killed by a poisoned dart is eaten without danger.

### SHRUNK HEADS.

Amazonian Indians are familiar with the process of mummifying dead bodies. As a rule a corpse is flung into the river, but when killed in combat the body is mummified, wrapped in bark, and placed on a stand in the centre of the hut as an object of veneration. Some notion of their methods of mummification may be gathered from the way these Indians treat the heads of victims slain in combat. The conqueror cuts off the head, splits the scalp by a vertical incision in the occipital region, and neatly removes the skull with the brain, eyes, muscles, jaw, and tongue, leaving the skin of the face and the scalp intact. The incision is joined with a continuous stitch (Fig. 2), and the cutaneous bag is stuffed with hot pebbles, or hot sand,

FIG. 2.—Shrunk head of an Aguaruna. The hair has been removed from one side to afford a view of the scalp and to expose the line of the incision which permits the extraction of the skull. The material used to sew the lips together is twisted cotton-thread. The scalp is slung by a plaited loop. (*Museum, Royal College of Surgeons.*) (½ nat. size.)

and carefully dried in the sun. When this crude taxidermic process is complete, the skin shrinks to the size of an orange, preserving the features. The lips are stitched together with threads, which are left long, and dyed red in such a way as to present alternate bands, coloured and uncoloured. The lips are sewn together to prevent the victim retorting when his conqueror freely curses him. A cord is attached to the vertex of the scalp to enable the trophy to be slung on the girdle of the warrior. Some of the

cords are decorated with scarlet feathers. The skin of the face is smoked, polished, and sometimes smeared with red dye. (Fig. 3.)

There are two shrunk heads in the Natural History Museum, South Kensington, probably the first examples seen in London. They were shown to the Anthropological Society of Paris, in 1862, by Dr. Moreno-Maiz, formerly surgeon-in-chief of the Peruvian army, who presented them to the museum. The heads were given to Moreno-Maiz by M. Galvez, the Peruvian Minister in Paris; they were found in an Inca tomb in the territory occupied by Jivaros Indians (Ecuador). Dr. Moreno-Maiz appreciated the heads as excellent examples of taxidermic art, detected the manner in which the skull had been removed, and the skill with which the shrinking had been carried out with conservation of the features. Dr. Billavisencio examined pieces of the mummified skin histologically; sweat glands and their ducts, hair bulbs and sebaceous glands, and the layers of the epidermis were easily recognised. The heads were those of Jivaros warriors, and were probably preserved from religious motives, for these Indians did not bury the heads of the dead with their bodies in cemeteries, but after conservation placed them around their houses, and preserved them with respect, for these cherished remains protected the families from their enemies. For these Indians, death was not a natural phenomenon; it was a consequence of witchcraft, the occult and culpable action of enemies, known and unknown. Bollaert published a good account of the Jivaros Indian in 1863.

FIG. 3.—Shrunk head of an Aguaruna. (½ nat. size.) The hair is coarse like that of a mane or tail, raven black, and two feet or more in length. (*Museum, Royal College of Surgeons.*)

The knowledge of this peculiar method of preserving heads has come down from the Incas of Peru. The body of a dead Inca was skilfully mummified and removed to the great Temple of the Sun at Cuzco. The Peruvian sovereign on entering the sanctuary of the dead might behold the effigies of his royal ancestors ranged in opposite files—kings on the right, queens on the left. The bodies, clothed in the princely attire which they were accustomed to wear, were placed on chairs of gold, their faces exhibiting the natural dusky hue, their forms and lineaments true to life (Prescott). Garcilasso saw them (1560) and described them "perfect as life without so much as a hair or an eyebrow wanting."

Mummified Incas were treated with reverence, but to-day, Indians, living in the seclusion of the dense forests, are described as devoid of emotions such as love, pity, admiration, wonder, and joy. They are superstitious, and superstition is born of fear of spirits, good and evil. It is difficult to believe, as some assert, that Indians lack imagination when they practise the diabolical art of curing the skin of an adversary's head, shrink it to the size of a lemon, preserve the features, even the eyelashes and eyebrows, and sew the lips together, so that when they curse the victim the leathery lips can make no reply. *Surely belief in spirits, good and evil, depends on the faculty of speech.* In London there is now a fair number of these curious heads available for study. The Natural History Museum possesses two, the Royal College of Surgeons six; the British Museum has three, and a collection of hunting and domestic implements used by Peruvian Indians. The Wellcome Historical Medical Museum contains 13, and there are many kept as curios by travellers. When a demand for such heads arose many were forthcoming, but traffic in these gruesome curios is discouraged lest it should lead to undesirable methods of obtaining them.

### EAR-PLUGS AND LABRETS.

When Columbus discovered Honduras during his fourth voyage (1502) he named part of the seaboard *Costa de la Oreja* in reference to the ears of the natives enlarged with plugs. The Indians inhabiting the forests wear ear-plugs and labrets. Some of the tribes were named by the Portuguese *Botocudos* on account of this habit, *botoque* being the Portuguese name for a plug. The ear-plugs of the Botocudos are sometimes four inches in diameter. There are plugs of this size in the British Museum, and they resemble buns. The plugs can be slipped in and out of the loops like buttons. Some ear-lobes are so distended with huge plugs that they reach to the shoulders and resemble the wings of bats. (Fig. 4.)

Drs. Spix and Martius, in 1817, under the auspices of the King of Bavaria, made a journey for scientific purposes through the Amazonian forests. Spix was responsible for zoology and Martius for botany; they subsequently wrote an instructive book, entitled "Travels in Brazil." The first native American they saw was a boy of the cannibal race, called Botocudos, whose story is curious. A former minister of State had applied to the district commander for an Indian skull, which he required for Prof. Blumenbach. The commandant had no opportunity for obtaining a dead specimen, so he sent two living Botocudos, who had been taken in a sudden attack by his soldiers. Von Langsdorff obtained one of them, to whom he soon became much attached, and "who served him not only as a living cabinet-piece, but as a collector of objects of natural history." This boy wore not only ear-plugs, but also a large labret.

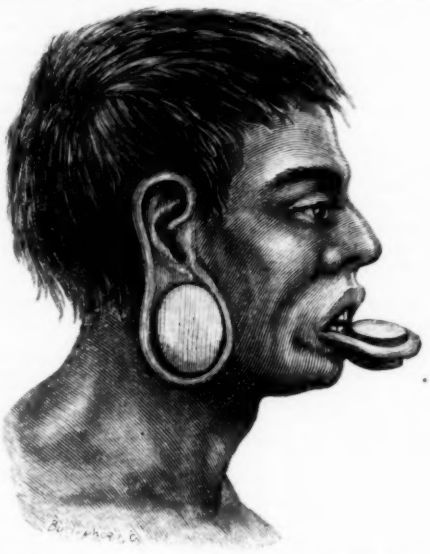

FIG. 4.—Head of a Botocudo with ear-plugs and labret.

Ear-plugs are instructive in regard to the view that the method of mummifying heads is of Incarial origin. The heir to the Inca throne received a military education with the sons of the nobles. At the age of 16 these boys were submitted to a public examination in order to show their prowess in the athletic exercises of warriors. They were admitted into the order of chivalry by the Inca in the following manner:—

The novice knelt before him and he pierced the lobe of the ear with a golden bodkin, and this hole was

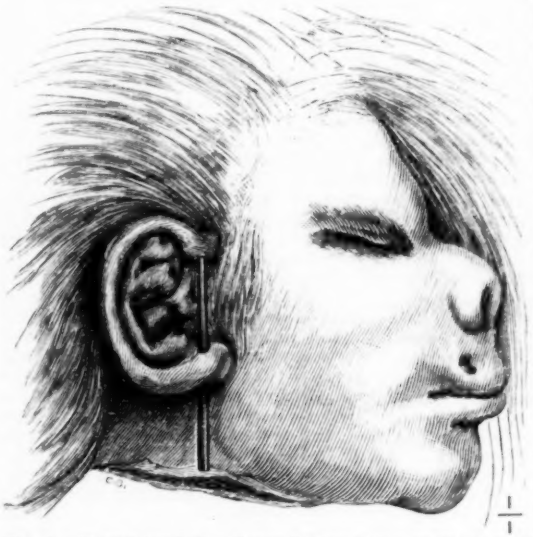

FIG. 5.—Shrunk head of a Jivaro Indian with a spigot of wood in the lobe of the ear. (*Museum, Royal College of Surgeons.*)

gradually dilated until it became large enough to receive an ear-plug. "This monstrous deformity was regarded as a beauty by the natives" (Prescott). The ears of shrunk heads sometimes contain a wooden spigot in the lobules. (Fig. 5.) The Royal College of Surgeons contains two examples, and I think this is peculiar to the Jivaros. There is an example in the British Museum (probably the head of a chief), with preserved skins of brightly coloured birds hanging as ornaments from the lobe of each ear. Gorgeous

FIG. 6.—Head of Gotos Indian with ear-plugs. (*A. Miles Moss.*)

plumes of feathers are worn by the men on festive occasions. It is clear that there are two kinds of shrunk heads, one set obtained from enemies slain in combat and the other heads of chiefs. The former are freely cursed by their captors, the latter, decorated with bright-coloured feathers, skins of gaudy birds, and iridescent wing-cases (elytra) of large beetles, are venerated and worshipped as idols.

The Rev. A. M. Moss (1909) succeeded in recovering some photographs, obtained by Mr. Kroehle, of Indians living along the tributaries of the Amazon. Some of these photographs show Gotos Indians with ear-plugs. (Fig. 6.) Kroehle lived for some time among the Indians and received an arrow wound which "hastened his death." On the back of a photograph is written the significant word *Anthropophagus*. Spix and Martius reported that the Botocudos were cannibals.

Opportunities for seeing Indians in Brazil with ear-plugs and labrets are rare. In British East Africa they are common, especially among the Masai and Kikuyu. These deformed ears are objects of great pride to their possessors. To break the loop is an insult, and when men quarrel they snatch at the ear-loops. If the loop be completely detached the damage is irreparable, but if merely broken the torn ends are cut, the freshened edges are superimposed and held in position until bleeding ceases. The apposed ends of the loop are then bound together. Each tribe has a man who performs these operations. Without the plug, the large ear-loops resemble rubber rings, and the men loop them over the helix for protection.

It is clear that Amazonian Indians, as well as the natives of East Africa, like surgeons in civilised countries, are familiar with the elastic properties of human skin. Shrunk heads, ear-plugs, and labrets appeal to me. My father taught me to stuff birds at the time my mother stuffed me with the creed and Ten Commandments. Later in life I saw savages ornamented with feathers, skins, teeth, and claws in tropical forests; similar decorations are worn by fashionable human beings who strut in Piccadilly or parade the paddock at Ascot.

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# An Address

ON THE

# MATERNAL MORTALITY OF CHILD-BEARING:

## ITS CAUSES, AND HOW TO DEAL WITH THEM.

*Delivered at the Inaugural Meeting of the Midland Medical Society on Oct. 25th*

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DEATH when it comes to the young is always a pathetic occurrence, but a peculiar pathos attaches to the death of a young woman in childbirth. In the year 1920, 5413 women, six out of every seven of whom were under 35 years of age, died in the United Kingdom from causes incidental to child-bearing. A good deal of this loss of life cannot be avoided, nevertheless it is an incontestable fact that large numbers of women who enter upon the process of labour in good general health, and free from obstetric complications, none the less lose their lives. The loss of so many young mothers entails so much disruption of family life and consequent economic loss to the State, that it has rightly come to be regarded as one of the burning questions of the hour. A special responsibility for this particular form of mortality is usually laid at the door of the medical profession, and my conviction that there is a certain rough justice in this attitude has led me to desire to discuss the matter with this great society.

A good deal of attention has been directed from time to time to the fact that the mortality-rate from sepsis in childbirth has shown no noteworthy diminution in the last 20 years, although during the same period great progress has been made in the elimination of septic complications from all branches of surgical work. The facts are undeniable, and I shall give some figures which bring us up to the end of the year 1920, and which show that the most recent tendency of the mortality-rate from sepsis in childbirth is to rise, rather than to fall. I am very glad to discuss this subject with a society in which general practitioners are largely represented, because the great bulk of midwifery practice is in their hands.

We must first get a clear idea of the nature of the problem of protection against the dangers of child-bearing. Attention has been directed to the consideration of sepsis, to the practical exclusion of other causes of death in childbirth, some of which may prove more easily dealt with than infection. We must look at the mortality as a whole, and review its principal elements, in order to avoid taking steps which, useful in one respect, may prove harmful in another. To many minds the dominating consideration in the conduct of labour is the antiseptic technique which should be adopted during the process of birth and the subsequent lying-in. Some three years ago my friend, Mr. Victor Bonney, addressed himself to this subject[1]; his three principal points were that midwifery should be regarded as a branch of surgery, that labour should be conducted as a surgical operation, and that the chief source of puerperal infection was the rectum. He accordingly advocated a technique designed to prevent infection of the genital canal from the rectum. Narrow views of such a vital subject as that we are now discussing are to be deprecated, and I shall ask you to look at it not merely as a problem in antiseptics, but as a complex problem which in some of its aspects is medical rather than surgical, and is also related to pediatrics.

[1] Proceedings, Section of Obstet. and Gynæcol., Royal Society of Medicine, October, 1919.

### TOTAL MORTALITY OF CHILD-BEARING.

Our information as to the causes of death in childbirth comes from the three annual reports of the Registrars-General for England and Wales, Scotland, and Ireland respectively. Unfortunately these reports are not drawn up upon an identical plan, but I have found it possible to take out sets of figures strictly comparable with one another, which are set out in the tables. These figures represent what we may call the net mortality of child-bearing.

Table I. and Chart 1 give the total mortality of child-bearing in each of the three divisions of this country for the 10 years 1911 to 1920 inclusive, the latest for which the figures are available.[2] This period includes the war years; the figures are interesting on account of the fact that the profession was then depleted of nearly all its young men, and the midwifery work of the country was, to a much greater extent than is usual, done by senior men, who too often worked under great pressure. Taking 1915–1918 inclusive as the war years, the average rates for these years are 4·01 for England and Wales, 5·16 for Scotland, and 5·14 for Ireland. These figures approximate so closely to the average figures for ten years in each division that we may say that the efficiency of the midwifery services in the country was well maintained during the war. In the last two of the war years—viz., 1917 and 1918, the rates for England and Wales and for Ireland were abnormally low, while the Scottish rate rose somewhat. The birth-rate in 1918 fell to a level lower than has ever been known in recent times, the total births for England and Wales being 25 per cent. less than in 1911. This reduction in the amount of midwifery work no doubt compensated to some extent for the shortage of medical men. The rise in the Scottish rate suggests that the shortage may have been more severely felt in that country. I have tried to obtain information as to the proportion of cases attended annually by midwives and doctors respectively, for it is reasonable to suppose that midwives would attend a larger proportion during the war years than in ordinary years. Unfortunately the information is not obtainable, as the Ministry of Health only began to collect statistics of the number of births notified by midwives in 1918, although the Notification of Births Act came into force in 1915. In England and Wales over one-half of the total births were notified as having been attended by midwives during 1918 and 1919, the exact figures being 51·8 per cent. in 1918 and 54·5 per cent. in 1919. The returns for 1920 are incomplete, but the proportion was apparently a little higher than in 1919. The influence of the practice of midwives upon the maternal mortality of childbirth is therefore important; but we cannot tell to what

TABLE I.—*Total Mortality of Child-Bearing.*

| Year. | England and Wales. | | Scotland. | | Ireland. | |
|---|---|---|---|---|---|---|
| | Total births. | Mortality per 1000. | Total births. | Mortality per 1000. | Total births. | Mortality per 1000. |
| 1911 | 881,138 | 3·87 | 121,850 | 5·72 | 101,758 | 5·04 |
| 1912 | 872,737 | 3·98 | 122,790 | 5·12 | 101,035 | 5·43 |
| 1913 | 881,890 | 3·95 | 120,516 | 5·62 | 100,094 | 5·25 |
| 1914 | 879,096 | 4·17 | 123,934 | 5·28 | 98,806 | 5·04 |
| 1915 | 814,614 | 4·18 | 114,181 | 5·28 | 95,583 | 5·38 |
| 1916 | 785,520 | 4·12 | 109,942 | 5·02 | 91,437 | 5·48 |
| 1917 | 668,346 | 3·88 | 97,441 | 5·11 | 86,379 | 4·93 |
| 1918 | 662,661 | 3·88 | 98,551 | 5·24 | 87,304 | 4·80 |
| 1919 | 692,438 | 4·37 | 106,268 | 5·06 | 89,325 | 4·84 |
| 1920 | 957,782 | 4·33 | 136,546 | 5·20 | 99,536 | 5·52 |
| Average mortality-rate of 10 years | | 4·07 | — | 5·26 | — | 5·17 |

[2] Readers of Mr. Bonney's paper will notice that his figures of the total mortality of child-bearing exceed those given in Table I. This is because he has included deaths from intercurrent affections, such as enteric fever, influenza, pneumonia, &c. This mortality cannot fairly be considered as part of the mortality of child-bearing, and it has consequently been excluded from consideration here.

extent the proportion of cases attended by midwives increased during the war, although there is a general tendency for the proportion to rise during the period for which figures are available. On the whole the general tendency of the total mortality-rate, considering the difficulties of the period under review, is not unsatisfactory, until the last two years (1919 and 1920) are reached. These two years showed a very decided rise in the death-rate, which reached its maximum in Ireland. Both in England and Wales and in Ireland the year 1920 gave the highest rate for the whole period; the Scottish rate did not quite reach the abnormally high point shown in 1911. It is certainly disquieting that this rise in the total mortality of childbirth should coincide with the emergence of the country from the difficulties of the war period, and the restoration of our medical services to pre-war conditions.

CHART 1.

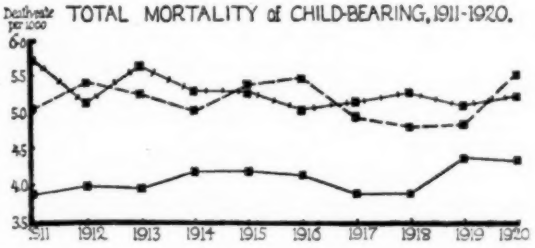



CHART 2.

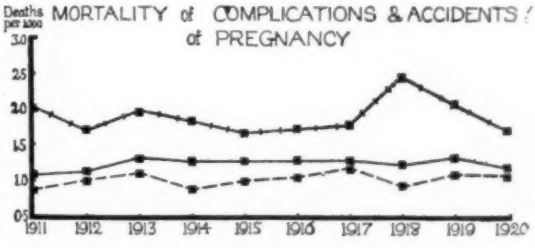



CHART 3.

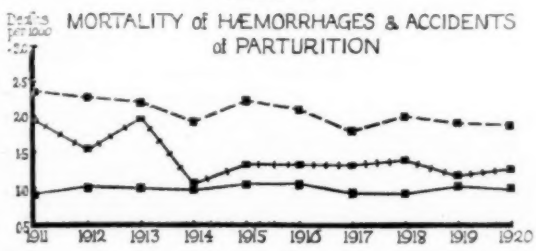
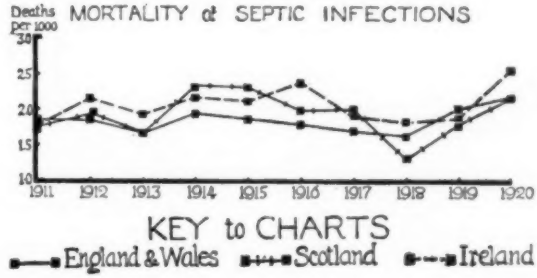



CHART 4.




It will be understood that the figures in Table I. represent the total mortality of child-bearing—i.e., they include deaths during *pregnancy* from such essential complications as abortion, extra-uterine gestation, eclampsia, and other toxæmias, as well as deaths from complications of *childbirth*—i.e., of labour and the puerperium. In order to get closer to the question of the mortality which attends parturition *per se* we must analyse these figures. We must first take out the deaths which occur from essential disorders of pregnancy such as the toxæmias—e.g., albuminuria and eclampsia, and pernicious vomiting; also such conditions as extra-uterine gestation, and abortion. This we may call for our present purpose the "mortality of pregnancy" to distinguish it from the other group which will then represent the "mortality of parturition." Chart 2 gives the death-rate per 1000 births from the complications and accidents of pregnancy. The ten years' average is shown in Table II.

TABLE II.—*Various Mortality-rate Averages per 1000 Live Births.*

| Years. | Mortality-rate average. | England and Wales. | Scotland. | Ireland. |
|---|---|---|---|---|
| 10 (1911–1920) | Total pregnancy (Table I., Chart 1) | 4·07 | 5·26 | 5·17 |
| 10 (1911–1920) | Complications and accidents of pregnancy (Chart 2) | 1·233 | 1·897 | 1·026 |
| 9 (1912–1920) | "Puerperal convulsions" and "albuminurias of pregnancy" | 0·80 | 0·96 | 0·64 |
| 10 (1911–1920) | Hæmorrhages and accidents of parturition (Chart 3) | 0·995 | 1·446 | 2·081 |
| 10 (1911–1920) | Sepsis (Chart 4) | 1·838 | 1·925 | 2·061 |

MORTALITY OF PREGNANCY.

In comparing one division of the country with another the interesting fact appears that the "mortality of pregnancy" rate for Ireland is little more than half that for Scotland, and is also considerably lower than that for England and Wales. This difference is so marked and so continuous that some deep-lying cause must be at work to produce it. The average mortality-rate of toxæmias and disorders of pregnancy per 1000 births in each of the three divisions for the last nine years is shown in Table II.; Scotland suffers most severely, Ireland escapes most lightly, while England and Wales occupy an intermediate position. What is the explanation of the comparative freedom of Ireland from the toxæmias and other disorders of pregnancy? Is it possible that the Irish race supports the strain of pregnancy better than the Scottish, the Welsh, or the English races? Or is it because so large a proportion of the Irish population is rural, living an open-air life, and subsisting upon a diet of fresher food than an urban population? The answer cannot at present be supplied.

This section of the mortality of child-bearing can, of course, be best attacked by antenatal work, and it is disappointing to find that during the period of years under review there is no appreciable tendency for the rate to fall in either division of the country. Scotland appears from the figures to have a good deal to make up in respect of the "mortality of pregnancy," and it would be interesting to see what effect would be produced if a systematic effort were made in that country to popularise the antenatal clinic. The low rate in Ireland is certainly not the result of intensive antenatal work, for I am advised that in that country antenatal clinics are almost unknown outside Dublin and Belfast.

MORTALITY OF PARTURITION.

The deaths which occur during or subsequent to parturition may be divided into two great groups: (*a*) Deaths due to hæmorrhage or to "accidents" of labour, (*b*) deaths due to sepsis. All deaths may be conveniently comprised under these headings. The hæmorrhages include the ante-partum, post-partum,

and puerperal varieties. The "accidents" include rupture of the uterus or vagina, and deaths after instrumental or operative delivery; "sepsis" includes all varieties of infection—uterine, peritoneal, venous, and mammary. In order to give some idea of the kind of cases which are included under "accidents of parturition," the following list of certified deaths is quoted from the Registrar-General's Report for England and Wales, 1920: Contracted pelvis, 62; rupture or laceration of the uterus, vagina, or bladder, 51; difficult and prolonged labour, 55; Cæsarean section, 37; malpresentation, 24; instrumental delivery, 11.

Chart 3 shows the death-rate per 1000 births from the hæmorrhages and accidents of parturition. The averages for the past ten years are shown in Table II. A possible explanation of the very high rate in Ireland might, I thought, be found in deficiency of hospital accommodation for midwifery cases in that country; I have found it impossible, however, to get complete information upon this point. Many beds in Poor-law institutions are occupied by midwifery cases of which there is no record; only the midwifery beds in general and special hospitals are definitely known. These I have obtained for the three countries, and worked out their relation to the number of births for the year 1920 with the following result:—

Number of hospital beds for midwifery per 1000 births: England and Wales, 1·7; Scotland, 4·8; Ireland, 2·2.

Thus, Scotland appears to be best provided with hospital beds for midwifery, while England and Wales are the worst, and Ireland is not much better than they are. Some other explanation than deficient hospital accommodation must therefore be sought for the relatively high Irish mortality from the hæmorrhages and accidents of parturition.

One more point is worthy of note in this table—viz., that the rise in total mortality during the last two years is not reflected in this chart at all; neither was it reflected in Chart 2, which shows the mortality of pregnancy. The rise in the last two years is, in point of fact, due entirely to the death-rate from sepsis. Chart 4 shows the mortality-rate from septic infections of all kinds. The ten years' average appears in Table II.

The rise in the mortality from sepsis occurred in a period of full employment and great industrial prosperity; all medical services were restored to their pre-war conditions. The year 1920 was extraordinarily prolific in this country; there was, therefore, more midwifery work to be done, but doctors were there to do it. In England and Wales 2087, in Scotland 295, and in Ireland 250 died of puerperal sepsis in that year. For this appalling loss of life we as doctors must accept our share of responsibility. This does not necessarily mean that we have been culpably negligent; I think it means rather that the system under which we work needs revision.

The mortality of childbirth clearly presents a somewhat different problem in the three divisions of this country. In Scotland the extension of antenatal care and management appears to be urgently required; in England and Wales this problem is much less acute, while in Ireland it is relatively insignificant. The *proportion* of deaths in parturition due to sepsis and the hæmorrhages and accidents is given in Table III. The great preponderance of sepsis in England and Wales is the outstanding point. In Scotland the position is much the same, while in Ireland the mortality is pretty evenly divided between the two. The relatively low death-rate from infection in Ireland is surprising in view of the prevalence of bad housing conditions and straightened economic circumstances in that country. As Englishmen we may well feel that we have enough on our own hands for the moment, and I do not propose to discuss the special points which arise in Scotland and Ireland. I will ask your attention rather to the conditions as they exist in our own country.

TABLE III.—*Proportion of Deaths in Childbirth due to (A) Sepsis, (B) Hæmorrhages and Accidents of Parturition.**

| — | England and Wales. | | Scotland. | | Ireland. | |
|---|---|---|---|---|---|---|
| | A | B | A | B | A | B |
| 10 years' average—(1911–1920) .. | 64·1% | 35·9% | 59% | 43% | 49·3% | 50·7% |

* Deaths from complications of pregnancy have been excluded.

### ANTENATAL SUPERVISION.

The education of the public upon the question of antenatal supervision is proceeding apace. The old view that an expectant mother has no need of a doctor until her baby is about to be ushered into the world, and that the less she sees of him the better until that moment arrives, is fast disappearing. It is for us rather to magnify the importance of our work than to minimise it, to explain to the expectant mother something of the risks she runs, and to insist upon the necessity of her keeping in touch with her doctor throughout pregnancy.

We owe three duties to every expectant mother who entrusts herself to our care; they are (1) frequent and regular examination of the urine; (2) a detailed obstetric examination of every primigravida in the early months; and (3) a detailed obstetric examination of every case in the last fortnight of pregnancy, primigravida and multigravida alike.

An immediate and deep impression upon the incidence of eclampsia would result from the universal observance of the first-named duty. Prof. Couvelaire, of Paris, told me, a few weeks ago, that at the Clinique Baudelocque, one of the great maternity hospitals of the city, eclampsia has in recent years almost disappeared. He attributes this to the fact that in Paris the midwives are required to carry out regular examination of the urine of all their patients throughout pregnancy. On the appearance of albumin the patients are at once sent to the clinique, and prophylactic treatment is almost always successful. The second duty would reduce our cases of obstruction discovered only during labour almost to vanishing point; the third would simplify attendance upon labour from the doctor's point of view to an extent which can perhaps be hardly imagined until it has been experienced. And let me appeal in this connexion for full advantage being taken of the antenatal clinics which in all our large towns can be used both for consultation and treatment. The prevention of difficulty before labour is much simpler than to escape from difficulties which have been overlooked until labour is advanced.

### CONDUCT OF NORMAL LABOUR.

It is, however, the mortality during and after parturition which most urgently requires attention. I therefore propose now to discuss in some detail the principles upon which labour should be conducted. I should like to ask in advance for your indulgence if I show at times an imperfect acquaintance with the conditions under which general practitioners do their work.

In speaking of the conduct of labour do not let us suppose it to be entirely a question of antiseptic technique, but the latter is so bound up with the general conduct of labour that it cannot be treated as a separate subject.

#### *Antiseptic Technique of Labour.*

I have long held the opinion that an elaborate antiseptic technique is not required in the conduct of ordinary labour. As a student I was greatly impressed by the comparative freedom from infection of the cases which I attended in the extern maternity work of the Edinburgh dispensaries, under the conditions of poverty and overcrowding so marked in the tenement dwellings of Scottish cities. There was usually a total absence of clean linen and towels, and our antiseptic materials were of the simplest kind. This was in the late "eighties," when sterilisation of

dressings was unknown, and rubber gloves had not been heard of. We relied upon carbolic lotions and attention to the general principle of surgical cleanliness, and the results were not unsatisfactory. The conditions under which the extern maternity work of our hospitals is now done have no doubt improved from the point of view of personal and domestic cleanliness in the homes of the patients; but whilst the simplest antiseptic technique is still employed, the results do not fall far behind those obtained in the hospitals.

I do not claim that our extern maternity work is as good as it can be made, or that it is a suitable field for the training of medical students or midwives. I have already expressed my views very fully on this point elsewhere,[3] and I will not repeat them here. I want rather to consider an irreducible minimum, because to formulate requirements which are not essential can lead to no practical results. It is necessary at once to draw a distinction between the conduct of normal labour on the one hand and all forms of operative intervention on the other; by normal labour I mean a labour in which the patient delivers herself without assistance involving any internal manipulations. For all forms of operative delivery our antiseptic technique must be, generally speaking, that which is requisite for a surgical operation. For normal delivery such elaborate technique is in my opinion not required.

*The Source of Puerperal Infection.*

Puerperal infection is no doubt due, generally speaking, to the introduction into the uterus of pathogenic bacteria. Where do these bacteria come from? Mr. Victor Bonney, whom I have already quoted, says that they come in most cases from the rectum of the patient, and he would have us swab the perineum, the vagina, and even the rectal canal itself, with a powerful antiseptic pigment upon which he places much reliance, and then cover the anus with sterilised dressings, which must be renewed as often as they become soiled. I do not agree with this view, and in his paper no pathological observations are adduced in support of it. Puerperal infection is a "dirt disease" like erysipelas, and wound infection in general, and the organisms which cause it are the same as those which also cause these diseases. The bacteriology of puerperal sepsis has by no means been worked out completely, but there is general agreement that streptococci are present either as a pure infection or in association with other bacteria, in from 70 to 80 per cent. of all cases. Bacteria of the *B. coli* group come next in frequency, but a long way behind the streptococci. Now there is good reason to believe that streptococci are to be found before labour in the vagina, and—less often—in the cervix, in about 20 per cent. of apparently healthy pregnant women.[4] In many instances they are probably saprophytic, but even so these subjects must be regarded as potential carriers of the very organisms which we desire to exclude. The parturient woman may be on the verge of danger from the organisms which she is carrying in her own genital passages, apart altogether from the possibility of infection from without. Under normal conditions the uterine cavity is sterile during pregnancy and labour. Gradual progressive invasion of the puerperal uterus from the vagina appears to take place normally in the early puerperium, and to be without ill-effect so long as it pursues its natural course. A recent research in which the bacterial flora of the uterine lochia were examined in 56 cases of normal afebrile puerperium showed that all contained bacteria from the second day onwards.[5] It is the *untimely access of bacteria* to the uterus—before it is ready to deal with them, so to speak—which is the cause of puerperal sepsis. Implantation in a more favourable environment may change bacteria of low virulence into formidable active organisms. Digital examination of the presenting part while it is in the uterus, and all forms of instrumentation of the uterus, may infect the uterine cavity with vaginal organisms or others introduced from without, and thus become the immediate cause of sepsis. Venereal discharges when present are, of course, a potent source of infection.

Auto-infection, either venereal or non-venereal, is an undoubted possibility, but it is easy to exaggerate its importance as a practical risk. The great majority of cases of puerperal sepsis are probably brought about by the introduction of fresh bacteria from without into the uterine cavity; when the uterine cavity is infected the placental site, with its large vessels, plugged only by blood clot, and its numerous small vessels which remain open, offers the most favourable opportunity for spread of the infection.

*Prevention of Puerperal Infection.*

In order to prevent infection of either variety, is it necessary to isolate the parturient canal, in the same manner that an operation wound is isolated during a surgical operation? If such isolation were essential to safety, the results of the extern maternity work of our hospitals, and the results obtained by midwives in their practice, would inevitably be very bad indeed. Yet such is not the case, and in support of this view I would like to refer to a statistical inquiry recently published by Miss Evelyn Brown,[6] from which she draws the conclusion that, taking large figures, there is no evidence whatever that the working woman is any more liable to puerperal sepsis than is the woman in good economic circumstances.

Two things only are actually required to prevent the access of these bacteria to the parturient uterus: (*a*) that the occasions on which the finger or an instrument is introduced into the canal should be limited to the irreducible minimum, and (*b*) that the vulvo-vaginal canal and the finger or instrument of the attendant should be surgically clean. I have not placed my second point before my first because frequent examinations, however carefully made, are an undeniable source of danger, and the first requisite therefore is to avoid them as far as possible.

We thus see how the general conduct of labour and its antiseptic technique are inseparably interlocked. In my opinion, most cases of normal labour can be put through without vaginal examination during labour, and this I hold to be a surer method of avoiding infection than the most elaborate antiseptic technique. If a complete obstetric examination has been previously made the presence of a medical attendant during the first stage of labour is unnecessary so long as it runs a normal course—i.e., so long as the pains show their normal intermissions. If the pains are normal a trained nurse is the only attendant required; and the public must learn to recognise that the continuous presence of the doctor is unnecessary if he has satisfied himself by recent examination that the general condition of the patient is satisfactory, that the pelvis is of normal size, and that the presentation is a vertex. The nurse should, of course, under no circumstances be allowed to make a vaginal examination in the absence of the doctor. I feel confident that many of the instances in which septic infection is said to have occurred in patients who have not been examined at all, are in reality due to unacknowledged examinations made by persons other than the medical attendant. To ensure the doctor's presence at the time of the birth, if he does not watch the rate at which the cervix dilates, is easy in the case of a primipara; he need not be there until the expulsive pains characteristic of the second stage begin, and this will be recognised by the trained nurse; in the case of the multipara let the nurse time the first-stage pains, and when they come oftener than every five minutes the doctor should be there. Further, with practice the progressive descent of the head can be followed by abdominal examination; detention of the head above the brim

[3] Report to the Section of Obstetrics and Gynæcology of the Royal Society of Medicine on the Training of Medical Students in Midwifery and Gynæcology, 1919.

[4] Hæmolytic Streptococci and Puerperal Septicæmia: A Bacteriological Study of 103 Labour Cases, Surgery, Gynecology, and Obstetrics, 1912, xv., p. 682.

[5] Dr. Alfred Loeser: Die Bakteriologie des normalen puerperalen Uterus, Zschrift. für Geb. und Gynäk., 1920, p. 577.

[6] Proc. Royal Soc. of Med., June, 1922: The Relation between Puerperal Sepsis and Other Infective Diseases.

can be very readily recognised in this way. These rules will lead to no more mistakes than may occur if the size of the cervix is relied upon, because the rate at which the cervix dilates is not regular throughout the first stage, and while many hours may be spent before it is one-third dilated the remaining stages may be very rapidly got over. Prolongation of the first stage of labour, when the local conditions are normal, is due to primary inertia—nearly always the result of nervous apprehension on the part of the patient—and characterised by pains either feeble and irregular, or very frequent, even continuous, severe, but ineffective. As long as these conditions continue little progress can be made and therefore frequent vaginal examinations yield no information; on the other hand, they increase the mental distress of the patient and raise the suspicion in her mind that all is not going well. The treatment is to give her gr. ¼ of morphia hypodermically, and leave her alone with the nurse for three to four hours. This is sufficient in most cases to alter the character of the pains, making them more regular and efficient, with normal intermissions and consequently normal progress of the process of dilatation. Some few cases may require the whole procedure known popularly as "twilight sleep," but these are very few. In all protracted cases the fœtal heart sounds must, of course, be carefully watched.

*Minimum Requisites for Normal Delivery.*

Under normal conditions, then, it is not necessary to make a vaginal examination until the patient is having expulsive pains, and usually the waters will have broken also. Consequently antiseptic technique resolves itself into that which is required for normal delivery. The point we want to agree upon if possible is, what is the irreducible minimum? Midwifery is notoriously badly paid, and to ask medical practitioners to expend considerable sums upon the provision of sterilised dressings when they only get from 2 to 5 guineas for the case is not practical politics, and no matter what specialists may say it will not be done.

The first requisite is a proper supply of clean sheets and towels, and in the case of patients too poor to provide them, the voluntary health societies or the local authority ought to come to their aid and provide an outfit for the occasion. I can imagine no more useful piece of voluntary work than this. In Liverpool there is a voluntary society which is working on these lines, and one hopes that the example will be widely followed. Local authorities also have the power to expend money for such purposes, and medical societies would do well to urge upon their local authority the necessity of allocating sums of money for this purpose. The alternative method of dealing with the very poor is to take them all into hospital; the necessary accommodation in hospital does not, however, exist, and to provide it at the present time would be an intolerable burden to the State, or in other words to the taxpayers. The second requisite is a trained nurse; no doctor should be asked to attend a confinement single-handed, for it wastes his time, and is incompatible with proper supervision of the labour and the lying-in. There are now in most places district maternity nurses whose services are available for patients who can afford only the doctor's fee. I am told that untrained monthly nurses are still sometimes employed, and I should like to ask you whether you think it is consistent with the interests of our patients, and with the dignity of our profession, for doctors to allow untrained persons to nurse their obstetric cases? A unanimous negative from us would lead to the immediate disappearance of this mischievous anachronism. The third requisite is that the vulva of the patient and the hands of the doctor should be surgically clean. The question of the vulva is a simple one. Having administered an enema the nurse clips the hair close to the skin all over, and then cleanses the surface of the vulva and the perineum with soap and water, followed by free swabbing with an antiseptic solution. When the head begins to distend the vulva the doctor swabs the previously dried surface all over with tincture of iodine. It is quite impracticable completely to sterilise such an area as the vulva, and all we can do is to make it surgically clean.

The question of the doctor's hands is difficult, and has been much discussed. From the nature of our daily work we are liable to be carriers, on our hands, of the very bacteria which we most desire to exclude. Apart from cases of erysipelas and scarlatina, which we now rarely see, we deal with ulcers, with suppurating wounds, with infected throats and noses, with skin suppuration such as boils and carbuncles, and with purulent discharges of venereal origin. We should as far as possible avoid contact with sources of infection by wearing rubber gloves for all our surgical dressings. Just as a pianist takes the greatest care of his hands a doctor should do likewise. If the principle of non-examination in the first stage is accepted, gloves will not be wanted until the head appears at the vulva; they are then kept on until the child is born, the cord tied, and the placenta delivered. But gloves have their limitations. The hands must be surgically clean before they are put on, for they often get torn. The advantage of using them is that the skin of the hands is thereby prevented from coming into contact with the surfaces of the genital canal. Sterilised gloves, however, only remain sterile so long as they are kept out of contact with unsterilised objects. Carefully used they are an absolute safeguard against one particular source of infection, but if we think that having once put them on we are absolved from taking further precautions we should do better without them.

The only antiseptic I have mentioned hitherto is tincture of iodine, and I have no special preferences. My own practice is to use a watery solution of biniodide of mercury both for my hands and for swabbing the vulva. Douching is, of course, unnecessary after normal delivery. Before leaving this point I must say again that this is the technique of *normal* delivery only; if there is to be any kind of interference, or if any complication arises, the requirements become profoundly altered.

OPERATIVE DELIVERY.

Passing now from normal labour to the subject of operative delivery, I must make a few preliminary observations. I cannot sufficiently emphasise my conviction that our first duty in the conduct of labour is non-interference. It comes before everything else, and is the basis upon which everything else should rest. One reason why I deprecate the view that the conduct of labour is to be regarded as a surgical operation is that in nine cases out of ten the obstetrician should not operate at all, but should stand by and watch. Attendance upon normal labour is an opportunity not for the display of surgical skill, but rather for the exercise of a wise and discriminating patience. An obstetrician in a hurry is dangerous; his duty is to let Nature do her own work whenever she can. The primary meaning of the Latin derivative of the word obstetrics is "standing by" (*ob sto*): it bore also a figurative meaning in the sense of "thwarting" or "hindering." The great practitioners of midwifery of the past, such as Smellie, understood their primary duty to be that of a watcher; only as a repercussion of the enormous developments of surgery in general has resort to methods of operative delivery become so frequent. There has of late years especially been a boom, so to speak, in operative delivery in this country, and Cæsarean section is being advocated so widely that the art of obstetrics seems likely to become lost. In the United States an important group of younger obstetricians are advocating and practising induction of labour in all cases before term, to save the patient from the discomfort of the last few weeks of pregnancy. It is being done in our own country also to some extent. Again, in an important American centre there is to be found an obstetrician who delivers all his cases by version as soon as the cervix is fully dilated, and he has even written a book advocating the general use of

this method. Others are found to advocate delivery by forceps and preliminary incision of the perineum in all cases as soon as the first stage has been completed—this term being taken to mean that the cervix is fully dilated. This is called the "prophylactic forceps operation," and is designed to secure a stronger pelvic floor after labour. In point of fact we are passing through a phase of meddlesome midwifery which I personally view with great concern. Many operative procedures, in themselves unnecessary, can be done with impunity as hospital "stunts" by men who have had the opportunity to acquire special skill; the general adoption of such methods would, however, inevitably lead to appalling disasters. We ought to set an example in the hospitals that can be followed outside them. As it is, hospital midwifery is getting out of touch completely with the simplicity of technique to be expected in the great majority of confinements occurring in this country. I have already mentioned three principles upon which the conduct of labour should be based: (1) Careful examination of the patient before labour; (2) a simple antiseptic technique; and (3) avoidance of vaginal examination until expulsive pains occur.

We may now add (4) great restraint in resorting to operative delivery.

*The Risks of Operative Delivery.*

Let us first consider a simple method such as forceps delivery, which is very freely used by most practitioners of midwifery. I recollect as a resident medical officer being very much struck by the fact that the morbidity rate—i.e., the proportion of cases in which the puerperium was febrile—was much higher in forceps cases than the general morbidity rate of the hospital. Some of our lying-in hospitals now publish statistics of morbidity; one of them I have looked up, and it shows that at the present time the morbidity rate for forceps cases is higher than the general morbidity rate in the proportion of about 7 to 4. If this occurs when the operation is performed under favourable conditions, and with skilled assistance, the results must be much less favourable when the environment is completely unsurgical, as is too often the case in private work. If forceps are applied unskilfully—e.g., before there is sufficient dilatation of the cervix—serious laceration of the cervix and the vagina may result, bringing the patient to the point of death. This, of course, is bad midwifery, and with that aspect of the matter we are not immediately concerned. What I wish to point out is, even when skilfully performed under the best conditions, there is a definite risk of infection attending the use of forceps. It may be granted that this infection is usually of a mild type, but even if not fatal, mild puerperal infection is the commonest cause of chronic pelvic inflammation, prolonged ill-health, and sterility.

Further, cranial and intracranial injuries to the baby are often caused by forceps; thanks to the recent researches of Mr. Eardley Holland and others, we know that these intracranial injuries are much more frequent in stillborn babies than was formerly believed. The forceps operation ought not to be regarded as trivial; it is attended by definite risks, and should be reserved for clear indications, and performed as carefully as any other surgical procedure. All other available means of assisting the patient to deliver herself should be adopted before resorting to the forceps operation.

By a judicious use of pituitrin we can frequently avoid the resort to forceps, and I can recommend this procedure with the greatest confidence if done under the right conditions. The simplest indication for its use is the primipara with the head delayed on the perineum, the presentation being an occipito-anterior vertex. This is perhaps the commonest indication for forceps also. Then 0·5 c.cm. of pituitrin or pitibulin given by deep injection into the buttock with a boiled syringe will often increase the force of the uterine contraction to a degree which will enable the head to be delivered; possibly the aid of a lateral incision in the perineum (episiotomy) may be also required. This incision, one to two inches deep, is made during a contraction with a pair of scissors, and as chloroform is being administered at the same time the patient hardly feels it. This so diminishes the resistances at the vulva that when the next pain comes the head can be expressed by pressure upon the fundus. At times a second injection of 0·5 c.cm. will be required; in a few cases no effect will be produced, and this is probably explained by the variability of our preparations of the pituitary gland. Efforts are now being made to standardise these, and failures will be avoided if this can be successfully done. It should be understood that an unreduced occipito-posterior position contra-indicates the use of pituitrin. To force the head through the vulva by means of powerful uterine contractions, the occiput being posterior, would lead to extensive lacerations, probably involving the rectum. The diagnosis of an occipito-posterior position when the head is on the perineum is so simple a matter that there need be no difficulty in avoiding this mistake.

The second instance is that of the multipara with a normal pelvis, and a vertex presentation, when the cervix is fully dilated, the membranes have ruptured, and the head is delayed, either on the perineum or higher up in the pelvic cavity, owing to feeble action of the uterus. Here the same procedure is indicated as in the primipara, except that incision of the perineum will in all probability not be required. In order to make the matter quite clear, let me state the contra-indication, to the use of pituitrin in labour as follows: First, pituitrin must under no circumstances be used until the cervix is fully dilated, either in a primipara or a multipara. Secondly, in a primipara it should not be used until the head has descended upon the perineum and is visible when the labia are separated during a pain. Thirdly, it should not be used in any case if the occiput lies to the back instead of the front.

I have not time to say much about other forms of operative delivery. It has always been a matter of surprise to me that craniotomy should so often be undertaken in quite unfavourable conditions. Now craniotomy is an operation which in hospital is attended by a considerably higher mortality than Cæsarean section. I have taken out some figures from the reports of two of our lying-in hospitals, one in London and one in the country, and the combined figures show that while the mortality of Cæsarean section was 7 per cent., that of craniotomy was 13 per cent. In my opinion this operation should not be undertaken in private unless it can be done under the conditions required for a major surgical operation.

I have come to regard digital extraction of the placenta from the uterus as of all minor operations the most likely to be followed by severe infection; except for the urgent indication of hæmorrhage I would rather wait any reasonable length of time for the placenta than remove it digitally from the uterus.

The third stage of labour puts the severest strain of all upon the patience and restraint of the obstetrician; yet his clear duty is to wait, and while watching the uterus, with the patient on her back, to leave it alone until the placenta has been detached. The signs of detachment are readily learned, and when they appear the after-birth can be safely delivered by expression. The only exception to this rule is when the patient is losing an abnormally large amount; then the sooner the placenta is delivered the better. Post-partum hæmorrhage is responsible for more deaths in labour than any other single condition, yet its occurrence can be avoided with practical certainty by the observance of these rules, except in cases of severe laceration when the hæmorrhage does not come from the placental site at all.

*The Antiseptic Technique of Operative Delivery.*

In the term "operative delivery" I include all internal manipulations intended to deliver or to assist delivery of the child, or of any part of it—such as

delivery of the arms, or head in breech cases, forceps extraction, division of the perineum, and digital extraction of the placenta, to mention only the minor procedures. Obviously such major procedures as plugging the vagina, the use of cervical dilators, and craniotomy call for the strictest antiseptic technique. The risks of infection are enormously increased by internal manipulation, which should not be undertaken unless the necessary antiseptic technique can be carried out.

Something like efficient isolation of the birth canal from its surroundings, in the surgical sense, should be aimed at, in addition to the minimum measures previously advocated. This means a tin of sterilised dressings which will add at least 20*s*. to the cost of the confinement, and a steriliser in which instruments can be boiled. The additional expenses should, of course, be borne by the patient, and this would have the indirect effect of educating the public as to the value of the services rendered in the performance of this obstetric operation. If it is done in a casual manner, without preparation and assistance, we cannot wonder if the public place a very low cash value upon it. For all these procedures I have mentioned I hold that a complete antiseptic technique is required; our duty is not to undertake them unless and until they can be put through in the same way as a surgical operation. For most of them an anæsthetic will be required; another qualified medical man should be there to give the anæsthetic.

### THE MANAGEMENT OF COMPLICATIONS OF LABOUR.

I have no time for more than a few words about the management of complications of labour. The great majority of births need little more than skilled observation, but very serious complications, ranking in importance with the gravest surgical emergencies, may arise before, during, or after labour. They may arise without warning, although some of them—e.g., eclampsia—herald their approach by certain well-defined premonitory and easily recognisable symptoms. Other complications which arise during labour, such as rupture of the uterus and post-partum hæmorrhage, are, generally speaking, preventable. It is to my mind very unfortunate that the complications of labour are not taken more seriously either by hospital authorities or by the public generally. The education of the public is, however, proceeding rapidly in this matter, and if ever money is freely available for hospital extension better provision for midwifery will doubtless be one of the first matters taken in hand. Ample provision of midwifery beds and free use of private consultation in obstetric difficulties would, I believe, have a marked effect upon the mortality of child-birth. Eclampsia, ante-partum hæmorrhage, obstruction in labour, rupture of uterus, vagina, or rectum, and puerperal fever require the best resources of hospital treatment, and should not under any circumstances be dealt with in the homes of the poor, nor in the homes of the well-to-do unless expert advice can be made freely available.

Let me take these conditions as examples of what I mean. Eclampsia in four out of every five cases is ushered in by premonitory symptoms which should not be difficult to recognise. Let us warn all our patients who have suffered from albuminuria during pregnancy that headache, vomiting, or disturbances of sight are signs of danger which should bring them immediately to us for advice. Seen in time, these patients may be rescued from this formidable complication by suitable treatment, but the emergency is so grave that the patient should be transferred at once to hospital, or in private cases the best expert assistance possible should be obtained for her. An eclamptic woman in labour living at a distance from her doctor, under conditions in which assistance is not readily available, is a tragedy which can only be dealt with by prevention.

No amount of careful supervision can guard against the occurrence of ante-partum hæmorrhage, which nearly always takes the form of a recurrence of hæmorrhages separated by intervals of days or weeks, the initial attack of bleeding being rarely sufficient to endanger life. Both varieties of ante-partum hæmorrhage are attended by a fœtal mortality of 60 to 70 per cent., but placenta prævia is much the more dangerous variety to the mother, and diagnosis becomes, therefore, a point of some importance. Accidental hæmorrhage is usually a toxic condition, accompanied by albuminuria; the absence of albuminuria in a case of ante-partum hæmorrhage suggests that it is due to placenta prævia. Further, the presence of the placenta in the lower uterine segment prevents the descent of the presenting part to its usual level. If the presenting part is unusually high and therefore unusually movable, and if the urine is free from albumin the case is in all probability one of placenta prævia. It is impossible at the first hæmorrhage to estimate the gravity of a case of placenta prævia, each succeeding hæmorrhage is likely to be greater than the last, until during labour furious bleeding, very difficult to control, may supervene. Every case of placenta prævia, after the first hæmorrhage, should be sent to hospital, or should be placed in a nursing home, or in other conditions where all means of assistance can be instantly available. My own opinion is that Cæsarean section should be performed, or labour induced, according to the circumstances of the case, after the first hæmorrhage. Lest I should seem to be magnifying the importance of this matter, let me add that in 1920 there were 253 deaths registered from placenta prævia in England and Wales alone. To conduct a labour complicated by ante-partum hæmorrhage under the makeshift conditions of the ordinary middle-class home, or, still worse, in the insanitary environment of the homes of the poor, is asking for most serious trouble.

Rupture of the uterus during labour is the gravest accident which can occur; being in almost all cases avoidable, it involves a special responsibility. The conditions which render its occurrence likely are mostly recognisable by examination before labour, such as the higher degrees of pelvic extraction, the presence of a tumour or an ovarian cyst in the pelvis, and gross malpresentation—e.g., the transverse lie. Forewarned by the existence of these predisposing conditions we can take the appropriate measures in time; otherwise disaster is pretty sure to follow. Many cases of rupture are caused by the untimely and unskilled performance of such operations as version or forceps extraction.

### MIDWIFERY FEES.

In conclusion, I should like to make a suggestion about fees for midwifery, although I do not know whether it will be a useful suggestion or not. The bulk of the midwifery work done by doctors is undoubtedly badly underpaid. It is perhaps not unfair to say that one result of this is that the doctor is unwilling and indeed unable to devote more than the absolute minimum of time to his cases; the patient's interests as well as the doctor's purse suffer in consequence. Is not our present system of a flat-rate for midwifery a mistake? Considering the variability of the work, the simplicity of some cases, the urgency of others, it is absurd that the doctor's remuneration should be calculated for all cases upon the minimum requirements of the simplest case. Would it not be better for us to charge a uniform retaining fee to cover the usual supervision during pregnancy, and an additional confinement fee which could be proportional to the duration of the attendance and the nature of the operative work, if any, which had been required? This would make clear to the public the essential difference between a simple labour which terminates naturally, and one where operative work is necessary.

We look, then, to the general practitioner to play the principal rôle in the improvement of midwifery results. More will be required of them in expenditure of time and professional skill, and their reward must be equivalent. Yet the greater reward will only be earned if a higher degree of skill and a greater devotion of time are forthcoming.

# THE INFLUENCE OF SATURNINE COMPOUNDS ON CELL-GROWTH,

## WITH SPECIAL REFERENCE TO THE TREATMENT OF MALIGNANT NEOPLASMS.

*A Preliminary Communication.*

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(WITH ILLUSTRATIVE PLATE.)

THERE are to-day probably few who believe that bacteria and parasites are ever more directly concerned in the production of malignant disease than through the irritation and injury which may be caused to the tissues by their activities. Reluctance to put aside the "parasitic theory" is no doubt in a measure due to the obvious conclusion that, if malignant disease be originated by a specific bacterium or parasite, curative treatment of the cause should, and eventually would, be available. To those of us who have always believed that malignant tumours arise as the result of some intimate biological (biochemical) disturbance the prospect of the specific treatment of an existing lesion has appeared remote; consequently, he problem has been approached with a scepticism that only exceptional results could modify.

Whether the results to be described later can be considered exceptional I do not myself feel justified in stating. Nevertheless, in the last few years it has been clearly demonstrated that particular varieties of neoplasm in favourable situations with suitable dosage have been so affected that not only has their growth been arrested, but they have also undergone absorption.

Although I am compelled to acknowledge that an attempt has been made to treat a condition of the intrinsic cause of which we have no proven knowledge, it cannot be denied that such a course is entirely justifiable, for, if the object be attained, light must at the same time be thrown on the nature of the disease treated, or at least an indication secured of the principles that should guide us in our search for the causal factors that have so long escaped recognition by other methods of research.

In the treatment of malignant diseases the investigator must always be prepared not only to suffer disappointment, but to expect it. He can never hope to benefit every case. Some patients are too near death when they seek assistance. Figures will be given directly which demonstrate this statement only too clearly. Others, possibly, will die from the treatment itself, for this must be directed to the annihilation of a part of the body of the patient; and again, others may die as the result of poisons generated or liberated by the retrogressive processes. Furthermore, no remedy for malignant disease is likely to be narrowly specific to one group of cells in the organism.

A consideration of the distribution of the lesions produced by malignant neoplasms, and of our want of knowledge concerning the moment when cells, which are potential originators of metastases, escape from the primary focus, makes it clear that to be generally useful the substance used in the treatment of the disease should be introduced into the blood-stream, and so be conveyed to all parts of the body in which metastatic growths may be developing as well as to the primary tumour. The inherent defect in treatment by X rays and radium lies in the purely local application and effect of radiations.

I was led to contemplate the use of saturnine preparations in the treatment of malignant neoplasms by the experimental support afforded to the issues converging towards the central argument which itself was based on the results of experiments concerning the abortifacient action of lead. I found that large doses had a cumulative, poisonous effect on embryonic cells—an effect which was most marked in the earlier stages of pregnancy. The other actions of lead on the organism were then considered, and as a result the main argument was formed.

### *Argument.*

Phosphatids, either themselves or through the medium of the phosphorus which they contain, appear to be essential to the development of the nucleus and the growth of animal cells, and to the physiological efficiency of important organs. One of the functions of the yolk-sac, especially in oviparous creatures, is the provision of lecithin for the use of the developing embryo. While probably present normally in all cells in the adult human being, as in the other higher animals, phosphatids are found in particular abundance in nervous tissues, in heart-muscle, in the suprarenals and pituitary, in the bone-marrow and the blood-cells, and in the sex-cells. These lipins appear to be of special importance, therefore, to those tissues of the body in which nervous and growth-producing energies are stored, and to those which are characterised by active cell-multiplication and replacement.

Now, lead, when taken into the organism, produces lesions which are, for the most part, referable to alterations in the nervous, genital, and vascular system. It is possible that these changes are due to a union of lead with the phosphatids contained in the cells concerned. It is not unreasonable, then, to argue that, if lead combines with lecithin, this metal may be expected to influence the growth of tumours rich in these substances. It is necessary, therefore, to inquire whether phosphatids are found associated with abnormal cell-proliferation, that is, in neoplastic developments. As a matter of fact, investigations[1] concerning the lipin content of malignant neoplasms show that rapidly-growing tumours contain a greater percentage of lecithin than those of slower development, and that sarcomata—which are usually much more quickly growing than carcinomata—contain not only a much larger quantity of lecithin than that found in carcinomata, but also cerebrosides which are not present in epithelial growths.

### *Chemical Evidence and Investigations.*

The argument is supported, in the first place, by the fact that *in vitro* the metal radicle in lead acetate appears to enter into chemical combination with lecithin. The substance formed may be recognised by the appearance of pansy-like bodies on a glass slide after evaporation of the continuous phase. These bodies take up basic stains in a particular manner (figure I.).

The probability of such a combination is not difficult to conceive, for lecithin is believed to be an unsaturated fat in which one of the acid radicles has already been replaced by choline and phosphoric acid. Yet the question may arise whether a true chemical compound is formed, or, more readily, an adsorption product.

That chemical combination takes place between lead and egg lecithin—the lipin used in these experiments—is made extremely probable—if not certain, so far as our knowledge enables us to be certain in such a matter—by the following facts.

(*a*) There is a definite mathematical ratio between the amounts of lead and lecithin entering into combination as determined for me by Mr. Patterson on three occasions in different concentrations at room temperature—namely, 0·495 g. of lead combines with 1·0 g. of lecithin, the variation in a number of control experiments being less than 0·1 per cent. If adsorption took place the quantity would vary considerably with many physical factors.

(*b*) The suspensoid liquid containing lead-lecithin only very slowly yields the lead when saturated with sulphuretted hydrogen; but eventually small black particles of lead sulphide are formed. The filtered fluid fails to yield the pansy-bodies of lead-lecithin.

(*c*) Pansy-bodies, as shown in figure I., can only be obtained by a combination of lead and lecithin. All

[1] Bullock, W. E., and Cramer, W.: Proc. Roy. Soc., Lond., Ser. B, 1913-1914, lxxxvii., 239.

controls and attempted combinations with other metals failed to give similar bodies.

(*d*) Lead-lecithin is colloidal in its physical properties.

It is unnecessary here to describe in detail the experiments mentioned above or to recount the particulars of other investigations conducted in order to discover whether lecithin combines with lead, for what has been stated is sufficient proof.

Much attention has been devoted to the preparation of colloidal combinations of lead suitable for intravenous injection; and this has proved a difficult and complicated problem. Fifty-five variations have been made. Even at the present time I am not able definitely to say which is the best from a therapeutical point of view. It seems likely that eventually slightly different preparations and different strengths will be used for different types of disease and different stages of the disease. The experimental state of treatment as at present practised does not entitle me to specify, in this preliminary paper, the exact nature of the materials employed.

*Experimental Evidence and Investigations.*

Much material has been collected from experiments on rabbits. These have chiefly been concerned with investigations into the effects of lead on the normal growth of young animals, and on the reproductive functions. The results obtained, and the material still to be fully examined, cover so much ground that only the most pertinent facts—namely, those concerned with reproduction—will be mentioned in this communication.

It has long been known that lead poisoning may produce sterility and abortion in the human subject. Rabbits, also, though very much more immune than Man to the effects of lead, appear eventually to suffer in the same way. A number of experiments on the pregnant doe—experiments which, as already stated, first led me to consider the further possibilities of the action of lead—seemed to show that abortion occurs as the result of the effect of this metal on the embryonic tissues. I have not yet been able definitely to decide whether abortion happens because the embryo is itself poisoned with lead—which can be recovered from the fœtal tissues—and dies, or because the chorionic epithelium through which the lead passes from the mother to her fœtus is affected. In the rabbit embedding of the ovum and placentation take place in a manner similar to that seen in the human subject, yet this creature has the disadvantages in connexion with the experiments under consideration that it is relatively immune to lead poisoning and the period of gestation is very short. In the buck rabbit poisoned with the inorganic salts of lead total loss of sexual potency can be induced. In such circumstances the testicles present a very interesting appearance; the spermatozoa, and later the spermatogonia, disappear (figures II. and III.). Colloidal preparations of lead have much less effect than inorganic solutions on the rabbit, but lead poisoning ultimately may supervene. As a rule, the animal quickly recovers when injections are stopped.

*Clinical and Pathological Evidence and Investigations.*

I decided at the outset to employ colloidal preparations of lead in the belief that there would be less danger of inducing saturnism with such preparation than with inorganic solutions. Nevertheless, though this appears to be the case, there is a real and serious danger in the long-continued use of lead in whatever form it may be administered, as will be indicated directly. The features—clinical and pathological—of lead poisoning in the human subject are too well known to need discussion here. Attention may, however, be called to the tendency of lead to be deposited in septic areas, such as the gum edges, possibly a point of importance in the treatment of ulcerating neoplasms. It is interesting to note that colloidal preparations such as those we have used have never produced in any of our patients signs of cerebral, spinal, or peripheral nervous involvement. The immediate symptoms that occur in persons who have received large doses have been headache, backache, vomiting, and occasionally rigors—symptoms common to any form of intravenous treatment. Protracted heavy dosage, however, may lead to profound changes in the blood, and more rarely to cardiac distress (? myocardial poisoning) as distinct from the blood-changes. The greatest danger appears to be the complete arrest of red-cell formation in the marrow. This may temporarily be combated by blood-transfusion, but the beneficial effects of this are but transitory. Experience has made it possible for a fairly accurate judgment of the patient's condition to be formed on the result of frequent examinations of the blood, into the details of which it is unnecessary for me to enter here. It may, however, be said that continued moderate dosage rarely has any deleterious effect on the health of the patient; indeed, it is remarkable how much and how quickly a patient under treatment may put on weight and improve in general appearance.

That lead reaches the malignant growth has been proved by chemical examination of the tumours subsequently removed. In these the metal has been found in quantities so great as to be out of all proportion to that contained in the rest of the body. So, too, in the fluid removed by paracentesis in cases of intra-abdominal malignant diseases lead has invariably been found.

It has already been emphasised that a large number of cases seek treatment too late. Perhaps the number of this character in my series of cases is unduly large, for I have not felt disposed to refuse any case, however advanced the disease might be; consequently, there was a certain number of deaths within a short while of the commencement of treatment. Yet, some apparently almost moribund patients have steadily improved. Nevertheless, in order to obtain a reasonable chance of benefit from this, or indeed from any other method of treatment, the patient should not be so ill as to be unable to survive about six months untreated. It is rarely possible by this method to secure rapid results.

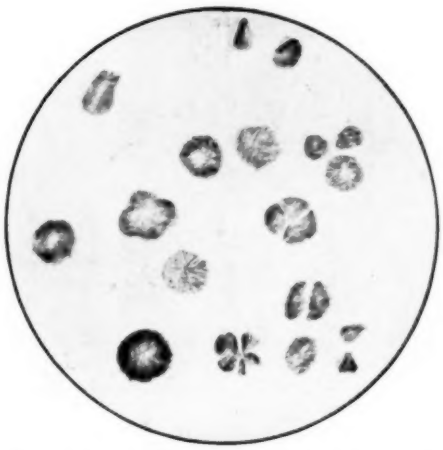
Two points of importance in regard to accessory treatment must now be mentioned. First, there appears to be no doubt that after treatment with colloidal preparations of lead and the deposition of the metal in the growth the action of X rays is greatly enhanced by the production of secondary radiations. There have been cases in which, although the growth appeared to be arrested after the injections, the nodules in the skin did not disappear until the affected areas had been exposed to X rays, a method of treatment that had been tried previously to intravenous injections and proved ineffective. Secondly, there is no doubt that the removal of any easily-reached mass of growth is desirable in order to lessen the amount of treatment necessary and to avoid certain complications already mentioned. It is advisable to proceed with the treatment immediately after operation, when there is a determination of blood to the parts.

It may therefore be stated quite clearly that although possibly extensive radical procedures may be inadvisable, surgery is in no way replaced by the method under discussion; indeed, within the limits mentioned, surgical procedures will be indicated in cases in which operation would otherwise be considered unjustifiable.

The following table includes all cases treated from the commencement—Nov. 9th, 1920—to August 9th, 1922. With regard to the cases believed to be completely cured, in only two can it be said indubitably that existing malignant disease entirely disappeared under treatment. Of the other two, the first had been under radium treatment in London, on the advice of a surgeon, whose opinion is authoritative in regard to malignant disease of the breast, for recurrence after extensive removal of the right breast. The arm on that side was greatly swollen with lymphatic and venous œdema. The second case was prophylactic from a few days after limited removal of a primary axillary carcinoma.

# PROF. W. BLAIR BELL: THE INFLUENCE OF SATURNINE COMPOUNDS ON CELL-GROWTH.

FIG. I.

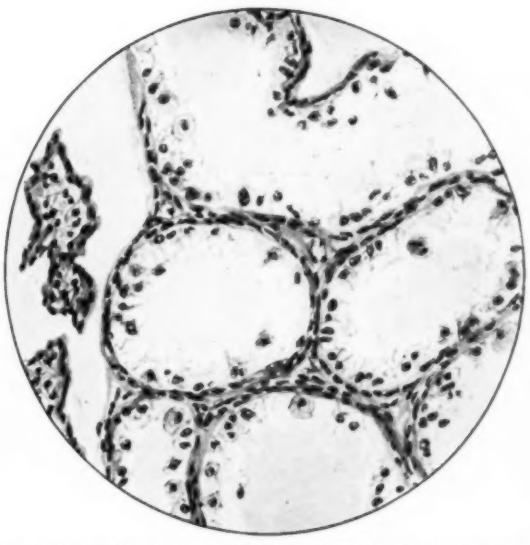


Pansy-bodies of lead-lecithin, coloured with Leishman's stain. (× 200.)

FIG. II.

Photomicrograph of a section of the testicle of the normal rabbit. (× 250.)

FIG. III.

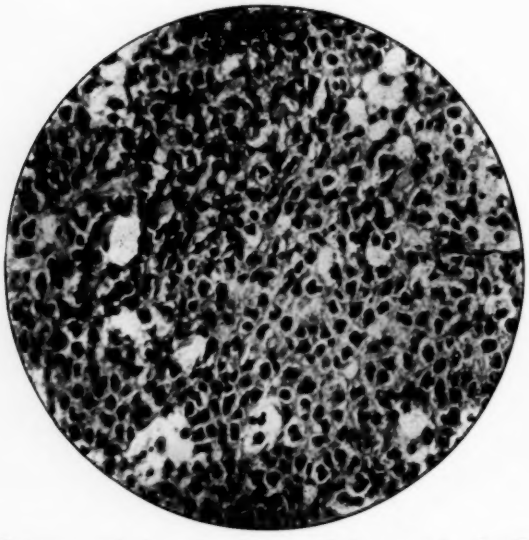


Photomicrograph of a section of the testicle of the rabbit after treatment with lead, showing the complete absence of spermatozoa and almost complete absence of spermatogonia. (× 250.)

FIG. IV.

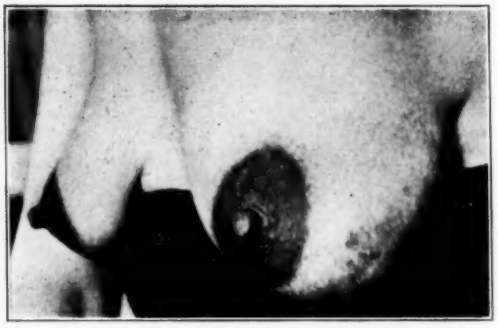
Case 1, showing the left breast occupied by masses of carcinomatous growth. The raised area close to the nipple is an ulcer with everted edges. The photograph is somewhat indistinct, but it has not been touched.

FIG. V.



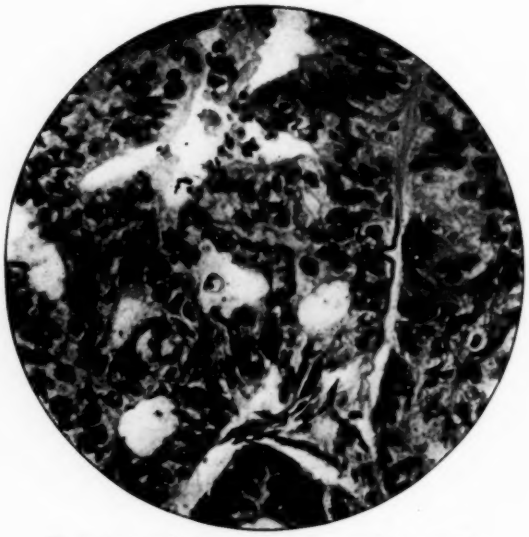
Photomicrograph of a section of the growth from case 1. It will be observed that the neoplasm is of a particularly cellular and malignant type. ( × 300.)

FIG. VI.



Case 1, showing the left breast 18 months after the cessation of treatment, and during the suckling of a child born in July, 1922.

FIG. VII.



Photomicrograph of a section of the ovary from case 17. ( × 300.)

FIG. VIII.

Radiograph of the œsophagus before treatment in case 32 after a bismuth meal. It will be observed that there is a serious hold-up, with a thin trickle through the growth.

FIG. IX.

Radiograph of the œsophagus in case 32 eight months after treatment commenced. The hold-up has disappeared, the passage is much wider, and the shadow of the growth much smaller than in the earlier radiograph.

*Table of Cases.*

| | | |
|---|---|---|
| Total number of cases treated | | 50 |
| Total number of deaths | | 21 |
| Number of deaths within 7 weeks— | | |
| Acute lobar pneumonia | 1 | |
| Post-operative shock | 1 | |
| Sudden heart failure | 2 | |
| After first injection | 1 | 13 |
| Liquefaction and absorption of toxins from a large tumour | 1 | |
| From malignant processes | 7 | |
| Number of deaths after 7 weeks— | | |
| Apoplexy | 1 | |
| Post-operative shock | 1 | 8 |
| From malignant processes | 6 | |
| Refused to continue treatment | | 4 |
| Treatment stopped as inadvisable* | | 6 |
| Believed cured | | 4 |
| Under treatment— | | |
| Much improved | 7 | |
| Improved | 4 | 15 |
| Not improved, but arrested | 1 | |
| Too recent to state results | 3 | |

* Two of these improved very much at first, but eventually relapsed. In this connexion the possibility of stimulation with small doses requires consideration and investigation. Of the rest, the majority were too ill to tolerate the injections.

The particulars of the four cases believed to be cured are as follows:—

CASE 1.—Female, married, aged 36. Carcinoma of left breast.

*Duration and previous history:* Patient has had three children. A lump in the breast was first noticed 12 months ago. Operation was considered useless by two of my surgical colleagues in June and August, 1920, repectively. She was admitted to the obstetrical ward at the Liverpool Royal Infirmary on Oct. 26th, 1920, for her confinement, which took place on Oct. 27th. The patient stated that the lump had increased rapidly during the period of pregnancy.

*Condition when first seen:* A large tumour occupied the lower external half of the left breast. (The main mass of the tumour measured 12 cm. across.) There was a large ulcerated area with everted edges near the nipple; there was also a number of isolated nodules (figure IV.), and there were enlarged glands in the axilla. On Nov. 3rd a small portion of the tumour was removed under local anæsthesia. On histological examination the growth was found to be a spheroidal-celled carcinoma of the medullary type (figure V.).

*Treatment:* The first injection was given on Nov. 9th, 1920. On Nov. 22nd, after five injections, the breast was very much smaller and the ulcerated area had healed entirely. On Dec. 8th the growth had practically disappeared and that the glands were much smaller. On Dec. 20th under local anæsthesia a small portion of hard tissue was removed from the breast. There was no histological evidence of carcinoma, but there were a few degenerated cells which might have belonged to the original growth. Treatment ceased on Dec. 15th.

*Subsequent history:* Since this time the patient has been seen regularly. She became pregnant again and was confined on July 15th, 1922. There is no sign whatever of any recurrence (figure VI.). The breast lactates normally, and the child is being suckled from it.

It was very fortunate that the first case treated should have behaved in such a satisfactory manner. The explanation of the rapid disappearance of the tumour can only be that the functional activity in the breast with increased vascularity enabled the injected material rapidly to reach the growth, and also enabled the tissues which became degenerated to be absorbed at once.

CASE 17.—Female, unmarried. Primary carcinoma of the ovaries (figure VII.). Duration (?) 1 year.

*Condition when first seen:* The general condition was very poor and the patient was miserably thin. Locally, bilateral carcinomata of the ovaries adherent to the peritoneum with scattered peritoneal nodules were present.

*Operation:* On Feb. 22nd, 1921, both ovaries and tubes were removed. The disease was considered too advanced to make removal of the uterus worth while. It was considered probable that the disease of the ovaries was secondary to gastric carcinoma.

*Treatment:* Commenced March 16th, ceased Nov. 11th, 1921.

*Subsequent history:* There has been steady improvement of the patient with no sign of recurrence. The peritoneal invasion has disappeared, and the patient now weighs 3 st. heavier than at the time of operation.

CASE 24.—Female, married, aged 56. (?) Recurrence and glandular invasion following carcinoma of the right breast, a section of which is in my possession.

*Duration and previous history:* A radical operation was performed on Nov. 27th, 1920. The right arm began to swell three weeks after operation. In May, 1921, the patient was examined in London, where it was stated that she had a malignant gland in the left side of the neck, and that the left breast probably contained malignant disease. An operation was deemed inexpedient. Radium and X ray treatment were carried out for some months without any alteration in the patient's condition.

*Condition when first seen:* The general condition was fair; the patient was very anxious. Right arm was very much swollen. A small suspicious superficial nodule in the scar was excised, but sections showed no evidence of malignant disease.

*Treatment:* Commenced July 15th, 1921. Eleven injections were given, the last on Oct. 24th, 1921. The arm was then much softer and less swollen and could easily be moved.

*Subsequent history:* The patient's general condition is very satisfactory. There is no sign of malignant disease.

CASE 25.—Female, married, aged 47. Malignant disease in right axilla.

*Duration and previous history:* An operation was performed on June 21st, 1921. The right breast was removed with the axillary glands. No growth was discovered in the mammary tissue, but carcinoma of a particularly malignant type was found in the glands of the axilla; a section of this is in my possession. It was considered doubtful by the surgeon who operated whether he had succeeded in removing all the growth, or even the primary source of the glandular invasion. It was, therefore, thought desirable that the patient should be treated, for recurrence was looked upon as almost certain.

*Treatment:* Commenced July 21st, 1921. Eighteen injections were given, the last on July 4th, 1922.

*Subsequent history:* When the last injection was given the patient appeared to be in perfect health. She has put on a considerable amount of weight since treatment commenced.

A number of the cases which died from other than malignant causes showed a very great improvement in regard to the neoplasm, but these cases have not been included in the list of cases as improved. It will be sufficient to relate two cases of this kind.

CASE 2.—Female, married, aged 61. Carcinoma of right breast.

*Duration and previous history:* A lump in the breast had been noticed for two years. Ulceration occurred nine months ago.

*Condition when first seen:* The general condition was poor. There was a large growth measuring 10·5 × 10·7 cm. in right breast. The skin was thin, shiny, and ulcerated over the right side of the tumour. The ulcer measured 4 cm. × 2·7 cm. The growth was fixed to the chest wall. There was a large, hard mass in the axilla and the supraclavicular glands were involved.

*Treatment:* Commenced Dec. 2nd, 1920. Five injections were given, the last on the 20th.

*Subsequent history:* The patient was allowed to go home for Christmas, where she contracted pneumonia and died on Dec. 27th. Her doctor wrote: "I examined the growth and found to my amazement that its appearance was greatly altered. The skin, which when I last saw her on Nov. 29th before she came under your care was tightly stretched over the growth, now appeared looser and more flexible and could be pinched up away from the growth. The ulcerated area was reduced in size and discharged blood-stained and purulent fluid in small quantity. But the most striking feature was the size of the growth which appeared to me to be about half the original size, and distinctly softer to the touch. There was very little tenderness and the patient repeatedly stated that she had lost all pain in it."

CASE 20.—Female, married, aged 63. Carcinoma of rectum.

*Duration and previous history:* Two years' history of pain in sacrum, and one year's history of hæmorrhage and passage of mucus.

*Condition when first seen:* The general condition was poor. The growth could be felt three and a half inches above the anus involving the whole circumference of the rectum. A portion of the tumour, equal in size to a walnut, was bulging into the posterior vaginal fornix.

*Treatment:* Commenced May 12th, 1921.

*Subsequent history:* Between this date and July 12th 15 injections were given. On the 12th the growth felt softer and was limited to the front wall of the rectum. The lump in the posterior fornix was still present. Between this day and August 13th, 1921, five more injections were given. On the last-named date the lump in the posterior fornix was found to have disappeared completely. There was still a tumour which felt cystic higher up on the left side.

Between this time and Oct. 19th, 1921, two more injections were given, and on this day, owing to continued pain and difficulty in obtaining a satisfactory action of the bowels, it was decided to attempt to remove the tumour that remained. This operation was performed, a small degenerating growth extending into the mesorectum being excised. The distal end of the bowel was closed and the proximal end was brought to the surface. The patient stood the operation well, but collapsed nine hours later and died suddenly. This sequence of events, which has occurred in another case, has led us to consider that serious operations are inadvisable *after* prolonged intravenous treatment, possibly owing to the action of lead on the heart-muscle.

In the case just described a considerable portion of the original growth had disappeared, and if colostomy only had been performed before treatment there seems to be little doubt that this patient would have entirely recovered.

Among the cases still under treatment a considerable number show improvement. The records of a few only are appended.

CASE 14.—Female, married, aged 64. Carcinoma of right breast of two years' duration.

*Condition when first seen:* The general condition was fair. The patient was a stout woman with bad chronic bronchitis. Locally, there was extensive carcinomatous disease of the right breast, which was adherent to the skin and pectoral muscles. There were large glands in the axilla.

*Treatment:* Commenced May 16th, 1921.

*Subsequent history:* The patient has now had 35 injections. During the progress of treatment the growth and the glands have diminished in size and some have been removed at different times under local anæsthesia. At the present time the patient appears to be quite well and her general health is good. A few hard movable, fibrosed nodules are to be felt in the axilla.

CASE 19.—Male. Carcinoma of rectum, of 12 months' duration.

*Condition when first seen:* There was a moderate-sized growth in the rectum with slight obstruction. The patient frequently passed blood and mucus.

*Treatment:* Commenced March 27th, 1921.

*Subsequent history:* The patient has had 34 injections and there is considerable improvement both in the general and local conditions. The patient appears to be perfectly well, and though a small tumour can be felt at the site of the original neoplasm, the growth of this appears to have been entirely arrested.

CASE 32.—Male, aged 67. Carcinoma of œsophagus, of (?) one and a half years' duration.

*Condition when first seen:* The general condition was poor. There was a large growth occupying the whole of the œsophagus in relation to the fourth and fifth dorsal vertebræ (figure VIII.). Patient was only able to swallow liquids with difficulty. Dysphagia had commenced acutely two months previously. There has been considerable loss of weight for one year.

*Treatment:* Commenced Nov. 23rd, 1921.

*Subsequent history:* After ten injections the notes of Feb. 7th, 1922, state that the patient was able to swallow rissoles, cottage pie, thick porridge, &c. On July 20th, 1922, after nine more injections, he was greatly improved. He was gaining weight, and on X ray examination it was found that there is now practically no hold-up of food and that the stream passing the obstruction is wide (figure IX.).

CASE 41.—Female, married, aged 39. Malignant disease of liver and peritoneum, secondary to carcinoma of right breast, removed in 1918.

*Duration and previous history:* The abdomen began to enlarge in July, 1921. She was first tapped in September, 1921. Tapping had been necessary every two or three weeks since this date and up to the time mentioned below.

*Condition when first seen:* The general condition was very poor. There was no local thoracic recurrence. Abdomen distended with free fluid, and liver much enlarged and very hard. Hard nodules were to be felt in various parts of the abdominal cavity. Bimanual vaginal palpation failed to reveal ovarian carcinoma, though this was probably present.

*Treatment:* Commenced March 24th, 1922.

*Subsequent history:* On April 29th, 1922, after five injections the patient felt very much better. A fair amount of fluid was present in the abdominal cavity, but the abdominal parietes were not nearly so tense as previously. She was tapped on this date through the posterior vaginal fornix. This was the third tapping since the commencement of treatment. Thirteen litres of fluid were withdrawn. The patient has had four injections since April and has not been tapped for ten weeks; there is very little fluid in the abdomen. Her general condition has greatly improved.

CASE 43.—Female, married, aged 44. Carcinoma of the ovary, omentum, and peritoneum.

*Duration and previous history:* The first operation was performed elsewhere four years ago, for carcinoma of the left ovary which was removed. There has been ascites for two years.

*Condition when first seen:* The general condition was fair. Abdomen distended with fluid. There was procidentia uteri.

*Operation:* The second operation was performed by me on April 9th, 1922, when a large proliferating carcinomatous tumour was detached from the right wall of the pelvis. This had probably arisen in the right ovary. Much growth was left at the base. Part of the omentum containing carcinomatous nodules was removed. Many nodules were left in the parietal peritoneum and in the remains of the omentum. A fortnight later an operation for a complete procidentia was performed.

*Treatment:* Commenced April 28th, 1922.

*Subsequent history:* On August 3rd, after ten injections, the patient appeared to be very well. There was no fluid in the abdominal cavity and all the nodules that could be felt appeared to be smaller. There was no prolapse.

CASE 44.—Female, unmarried, aged 35. Bilateral carcinoma of ovaries secondary to carcinoma of left breast.

*Duration and previous history:* An operation for carcinoma of the breast had been performed two and a half years previously. In February, 1922, the patient had an attack of abdominal pain diagnosed as peritonitis.

*Condition when first seen:* There was no local recurrence. The patient was rather ill-looking. The abdomen was full and the veins over it were distended. A hard mass was to be felt in the posterior vaginal fornix on bimanual examination. This was diagnosed as secondary malignant disease of the ovaries.

*Operation:* April 20th, 1922. Double malignant bilateral ovarian tumours were found and removed together with the tubes and the fundus of the uterus. In the neighbourhood of the cæcum several peritoneal nodules were left.

*Treatment:* Commenced May 18th, 1922.

*Subsequent history:* The patient has had nine injections and appears to be quite well. She is putting on weight rapidly.

To the improved cases mentioned above may be added the following, which, in addition, illustrates the beneficial effects of intravenous injections of colloidal preparations of lead, followed by treatment with X rays.

CASE 29.—Female, unmarried, aged 43. Recurrent carcinoma mammæ.

*Duration and previous history:* A lump in the right breast first noticed in April, 1914. A radical operation was performed in May, 1914. A local recurrence was removed in 1916. Right arm became greatly swollen in 1917. A lump appeared in the left breast in January, 1921, by which time there were numerous rapidly-growing local recurrences over the right side of the chest in front, and in the glands on the right side of the neck. The patient has had protracted X ray treatment and injections of selenium.

*Condition when first seen:* The patient had recently been seen by the surgeon who had operated upon her and by surgeons elsewhere. Her condition was considered hopeless. Her general state of health was fair, but she looked cachectic. Locally, the left breast was found to be solid with malignant disease. There were numerous cutaneous nodules in the skin on both sides of the chest. Hard enlarged glands extended up the right side of the neck, and the glands in both axillæ were involved.

*Operation:* The left breast was removed locally, but no radical extension to the axilla was made.

*Treatment:* Commenced Oct. 24th, 1921.

*Subsequent history:* On Nov. 1st, 1921, a radiograph of the chest indicated cancerous implication of the right lung and liver. In July, 1922, after 22 injections, which had produced a good deal of reaction, the patient appeared to be very well in herself, but there was no evidence of disappearance of the nodules in the skin. X ray treatment was then commenced in combination with further injections. By July 30th the nodules appeared to be getting smaller and flatter. At the present time the nodules seem to be slowly disappearing, and the patient is in good health.

### *Summary and Conclusions.*

1. Lead enters into combination, probably chemical, with lecithin.

2. Lead affects those normal tissues of the body in which lecithin or similar lipins are present in greatest quantity.

3. Malignant neoplasms contain lecithin in direct proportion to their rate of growth (Bullock and Cramer).

4. Intravenous injections of a colloidal preparation of lead, while not without danger, can, with experience, be so regulated that little or no disturbance is caused.

5. After previous intravenous injection of a colloidal preparation lead can be recovered from the malignant growth in a quantity proportionately greater than that contained in the rest of the body.

6. Lead in suitable doses appears in nearly all cases to arrest the growth of malignant tumours. In some cases treatment with this metal may result in disappearance of the neoplasm, possibly by the action of the normal tissues on arrested cell developments. The probability of this appears to depend on the vascularity of the parts. At the same time there is improvement in the general condition.

7. It is desirable when possible that the bulk of the growth be removed, and that this procedure be followed immediately by the injections while there is increased blood-supply to the part concerned.

8. Previous intravenous injections of a colloidal preparation of lead seem to increase the beneficial effect of X rays, owing to the promotion of secondary radiation.

9. It is possible that prophylactic treatment after complete removal may be of considerable importance with regard to the prevention of recurrence.

10. This investigation, although much time and labour have been given to it for more than three years, and although the results obtained are very suggestive, must be regarded as still in an experimental stage.

As some years must elapse before a further or final report can be presented, I wish forthwith to acknowledge with gratitude the unstinted financial assistance of Mr. J. Arthur Smith and Mr. John Rankin. They have made it possible for me to carry forward the investigations in many directions without undue delay. I wish, too, to express my sincere appreciation and thanks to those who have worked with me: Mr. H. F. Woolfenden (clinical), Mr. J. Patterson (chemical), Mr. R. A. Hendry (experimental), and in the early stages Dr. J. Bamforth (hæmatological).

Lastly, a committee, consisting of two surgeons, a pathologist, and a physiologist, whose names I refrain from mentioning at present lest additional weight be attached to their interest in the work, has followed closely the investigations and the members of it have given me the benefit of their experience and counsel, for which I am extremely grateful. It is, moreover, on the advice of this committee that publication is now made.

## AN INVESTIGATION INTO THE SEROLOGICAL PROPERTIES OF DYSENTERY STOOLS.

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THIS paper deals with an attempt made to ascertain whether the examination of the fluid portion of dysentery stools would afford information as to the nature of the dysenteric infection. The investigation was based on the following argument: Bacillary dysentery, being an acute inflammatory condition set up by bacterial agents of the *B. dysenteriæ* group, the intestinal exudate resulting therefrom would contain specific antibodies to these organisms. In amœbic dysentery, where the infection is caused by a protozoal agent, such specific antibodies to the *B. dysenteriæ* group of organisms would be absent from the intestinal exudate. The intestinal tract being the seat of inflammation in bacillary dysentery, it was thought that the fluid exudate of the stool would contain a larger antibody content at an earlier date than the blood serum, and therefore an early diagnosis not only as to the nature of the dysentery, but also as to the infecting organism in cases of bacillary dysentery, might be possible from the examination of the fluid portion of any given stool.

In the earliest cases both blood serum and intestinal exudate were examined for agglutinins; agglutinins for the *B. dysenteriæ* group were absent in the blood but were present in the intestinal exudate. Owing to the exigencies of the period it was not practicable to continue the examination of both the blood serum and intestinal exudate, and the scope of the investigation was limited to the examination of intestinal exudate only.

### *Part I.*

*Source of Material.*—The greater part of this investigation was undertaken in May and June, 1918, at the No. 3 Military Laboratory then stationed in Jerusalem. This laboratory received specimens from the surrounding field ambulances and from two neighbouring casualty clearing stations; as it was one of the first bacteriological filters behind the front line, the stools received were from men who had reported sick within the previous 24–36 hours.

*Clinical Details.*—Of the 40 stools specially investigated, clinical details were forwarded with 20; of these 15, all bacillary dysentery, were from men in their first week of illness (three in their second day, two in their third day, two in their fourth day, three in their fifth day, three in their sixth day, and two in their seventh day of illness); 4, three of which were amœbic dysentery, were in their second week; and 1 (amœbic dysentery) was in his third week of illness. There is no reason to suppose that a similar proportion as regards the duration of illness did not obtain in the other 20 cases in which no clinical details were available. There was a general consensus of opinion that the dysentery prevailing at this period was of a mild type.

*Nature of Material Examined.*—Specimens reached the laboratory in the usual fæces tubes; except in a very few instances at the beginning of the investigations, the whole stool was not available for examination, nor was any special selection of the stool made, nor did the cases come under my observation. Practically all the specimens received contained blood and mucus, but from the point of view of this investigation the stools could be divided into three groups: (1) Blood and mucus stools with apparently their normal complement of fluid exudate; (2) stools of blood and mucus only, with practically no fluid exudate; (3) blood and mucus stools with an abnormal amount of fluid. Although stools of Groups 2 and 3 were not specially suitable, it was decided to include them in this investigation, as it was particularly desired to ascertain whether this method could be applied to any stool sent for investigation.

#### *Procedure.*

The fluid portion of Group 1 was pipetted off and set apart for serological examination. In the case of Group 2 stools the blood and mucus was well shaken up with a small quantity of normal saline, and the supernatant fluid was used in lieu of the normal fluid exudate. Stools of Group 3 were treated as in the case of Group 1. The first intention was to examine the exudate for precipitins, but this was abandoned in favour of the agglutinin content. The technique adopted to ascertain the presence of and titre of agglutinins was that devised by Garrow.[1] This method was adopted because it enabled observations to be made with a small quantity of exudate, and also because it enabled me to make a large number of investigations in the limited time available amid the ordinary routine laboratory work. This point is specially emphasised because the agglutinin titre of the intestinal exudate is so comparatively low by this method that it might be considered negligible by laboratory workers accustomed to employ other methods. In addition to the examination of the serological properties of the intestinal exudate, the cytological characteristics (Willmore, Willmore and Shearman[2], Manson-Bahr,[3] Anderson[4]) of each specimen were observed, and plate cultures were obtained on MacConkey medium. Likely colonies were selected for subcultures, and these were examined subsequently for their bio-chemical and serological reactions.

*Results Obtained.*

*Group 1.*—Of the 26 cases examined *Amœba histolytica*, actively motile, was found in 2 cases, and not found in 24 cases. Taking this as a method of classifying the stools (following Woodcock[5]), Table I. shows the results obtained:—

TABLE I.

| Number of cases. | *Amœba histolytica* present. | *B. dys.* isolated. | Agglutinin to *B. dys.* present. |
|---|---|---|---|
| 2 | 2 | 0 | 0 |
| 24 | 0 | 15 | 18 |

*Titre of B. dysenteriæ agglutinins*: 1/10, 8; 1/20, 5; 1/40, 4, 1/80, 1.

*B. dysenteriæ organism isolated*: *B. dys.* Shiga, 15; *B. dys.* Flexner, 0.

| *Stools.* | *Agglutinins.* |
|---|---|
| 12 *B. dys.* Shiga isolated .. } | *B. dys.* Shiga present. |
| 6 ,, ,, not isolated } | |
| 3 ,, ,, isolated .. ,, ,, | not found. |

*Group 2.*—Stools of blood and mucus only containing an insufficient amount of intestinal exudate, to which it was necessary to shake up the mucus with saline, the saline washing so obtained being used in lieu of the normal fluid exudate—10 cases (Table II.).

TABLE II.

| Number of cases. | *Amœba histolytica* present. | *B. dys.* isolated. | Agglutinin to *B. dys.* present. |
|---|---|---|---|
| 2 | 2 | 0 | 0 |
| 2 | 2 (doubtful) | 0 | 1 |
| 6 | 0 | 5 (Shiga 4, Flexner 1) | 5 |

| *Stools.* | *Agglutinins.* |
|---|---|
| 4 *B. dys.* isolated .. .. } | *B. dys.* present. |
| 1 ,, not isolated .. } | |
| 1 ,, isolated .. .. | ,, not present. |

*Group 3.*—Stools where the amount of fluid was excessive—probably on account of admixture with urine—three cases. *B. dys.* organism was isolated in two cases, and *B. dys.* agglutinins were not present in three cases.

*Part II.*

In addition to examining the serological properties of the intestinal exudates against the stock (*B. typhosus*, *paratyphosus* A and B, and *B. dysenteriæ* Shiga and Flexner) organisms, it occurred to me that it would be valuable to put up the organisms that were being isolated from the plate cultures of these stools. It was argued that possibly there was a considerable difference in the type of dysentery organism prevailing locally, and that certain organisms giving the correct biochemical reactions of the *B. dysenteriæ* group, but not agglutinated by the Lister agglutinating sera, might be agglutinated by the intestinal exudate caused by the type of dysentery bacillus prevalent in the surrounding area. The procedure adopted was to subculture a number of colonies from each plate, no great regard being paid to the morphological appearance of the colonies as long as they belonged to the non-lactose-fermenting group of organisms. Emulsions of these subcultures were then tested against the *B. dysenteriæ* (Lister) agglutinating sera, and a classification made into agglutinable organisms, and non-agglutinable organisms. Organisms of both groups were then tested against the various intestinal exudates that were being obtained. It was found that, as a rule, the organisms isolated from a given stool were not agglutinated by their own intestinal exudate, and that in certain cases organisms not agglutinated by Lister *B. dysenteriæ* agglutinating sera were agglutinated by the intestinal exudates from other stools. On investigation of the biochemical characteristics of these organisms, it was found that, although a few gave the typical reactions of the *B. dysenteriæ* group, the vast majority gave a varied biochemical picture. It was then realised that these non-lactose-fermenting organisms belonged not to the *B. dysenteriæ* group, but to that group of dysentery concomitant organisms which had been so carefully investigated by Mackie at the Central Laboratory, Alexandria, and in England by Douglas, Colebrook, and Parry Morgan[6] and others.

With the view of ascertaining whether these organisms played a part in the pathology of dysentery it was decided to test the agglutinating capacity of each intestinal exudate that became available against emulsions of these organisms. For this purpose the Garrow agglutinating slide was of great value, as it was possible to test some 24 organisms at the same time. The organisms selected consisted of 3 organisms giving the typical biochemical and serological properties of *B. dysenteriæ* Shiga, 6 organisms having the typical biochemical properties of *B. dysenteriæ* Shiga, but not agglutinated by Lister *B. dysenteriæ* Shiga agglutinating serum, 1 organism having the typical reactions of the *B. dysenteriæ* Flexner, 4 organisms having the typical biochemical properties of the *B. dysenteriæ* Flexner, but not agglutinated by Lister *B. dysenteriæ* Flexner agglutinating serum, and a group of organisms, 10 in number, having varied biochemical properties, agreeing in the fact that they were all non-lactose-fermenting organisms.

This investigation had not proceeded far when it was brought to an abrupt stop by illness, but it may be of interest to give the table (III.) of the results obtained in connexion with the non-lactose group of organisms, which seem to suggest that a certain number of those organisms are an ætiological factor in dysentery, judging from the agglutinin content in the intestinal exudates.

TABLE III.—*Results Obtained with the Non-lactose Group of Organisms.*

| Organism. | Lactose. | Glucose. | Mannite. | Saccharose. | Dulcite. | *B. dys.* aggl. serum. | Intestinal exudate. | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | No. 35 | No. 37 | No. 40 |
| 1 | — | A | A | A | A | — | + | +20 | +10 |
| 2 | — | AG | AG | AG | — | — | — | — | — |
| 3 | — | AG | AG | AG | — | — | — | +80 | +10 |
| 4 | — | AG | AG | Tr. A | — | — | + | +20 | +10 |
| 5 | — | AG | AG | — | Tr. A | — | — | — | — |
| 6 | — | AG | AG | — | AG | — | — | — | — |
| 7 | — | AG | — | — | — | — | — | — | + + |
| 8 | — | AG | AG | AG | — | — | — | + 1/160 | — |
| 9 | — | AG | AG | A | AG | — | + | — | + |

| | | | |
|---|---|---|---|
| A = Acid productions only. | *B. typhosus* .. | 20 | 80 | 80 |
| AG = Acid-gas productions. | *B. para. ty.* A... | 20 | 10 | 10 |
| — = No change. | *B. para. ty.* B... | 20 | 40 | 40 |
| Tr. = Trace. | *B.* Shiga .. .. | 10 | 0 | 40 |
| | *B.* Flexner .. | 0 | 0 | 0 |

*Part III.*

On resuming work, being posted to a base hospital, further opportunity of examining the stools of early dysentery cases could not be obtained, but on the other hand, I had the advantage at the Cairo Military Hospital of being in charge of a dysentery ward, as well as of the laboratory. It was possible, therefore, to observe both the clinical and the pathological aspects of a number of chronic dysentery patients, many of them over a considerable period of time. The salient feature of many of these chronic dysentery cases was that although a normal stool was the rule, at intermittent periods, a stool would be passed containing a pledget of mucus tenaciously adhering to a soft fæcal mass. A microscopical examination of such pledgets of mucus revealed a number of much degenerated leucocytes with a few epithelial cells, and attempts to isolate dysentery organisms were invariably negative.

Encouraged by Colonel Carmalt-Jones (Consulting Physician E.E.F.), to whom I had shown the work done at Jerusalem, I decided to investigate these cases, arguing that this pledget of mucus was derived from some unhealed dysenteric lesion in the intestine, and would act as a sponge to absorb any antibodies formed by the dysentery bacilli. The pledget of mucus was detached from the soft fæcal mass and transferred to a test tube containing an equal volume of saline, and well shaken. After standing, the supernatant fluid was pipetted off and its serological properties investigated. In order to avoid the possibility of error on account of the presence of blood serum and its capacity to agglutinate the dysentery organisms in its lower dilutions, advantage was taken of the presence of vaccine agglutinins which were made to serve as an indication of the degree of dilution; a preliminary trial was made, using dilutions of the saline washing against the stock T.A.B. organisms. A dilution was then taken which had no action on these organisms, so that it was possible to feel reasonably satisfied that, if the saline washing at this dilution agglutinated organisms of the *B. dysenteriæ* group, this might be taken as evidence that the agglutination had not been produced by serum in low dilution, and in favour of regarding the condition as being bacillary in origin. Further corroborations could be obtained from the records of previous laboratory investigations during earlier stages of their illness, and also by examining the blood sera of these patients. The number of cases examined in this way was 14, of which 3 were amœbic dysentery, and the remaining cases bacillary. It was found that agglutinins to the *B. dysenteriæ* were present in the mucus and saline washings of all the bacillary cases, and absent in all cases of amœbic dysentery.

*Discussion.*

The observations detailed above show that the intestinal exudates of bacillary dysentery stools are capable of causing the agglutination of emulsions of dysentery bacilli. In amœbic dysentery (except in one doubtful case) these agglutinins are not present. In view of the fact that normal serum, in certain dilutions, has a similar capacity, it is necessary to discuss the question whether this agglutination by an intestinal exudate is caused by the normal agglutinins of blood serum, or is produced by a *B. dysenteriæ* infection. It is especially necessary to examine this point in view of the low titre given by the intestinal exudate as determined by the Garrow technique. In this connexion the opinion expressed by Glynn, and Cronin Lowe[7] is of great importance. These observers state:—

> "It is impossible satisfactorily to compare results obtained by using different macroscopic and microscopic techniques, and emulsions of different densities, of sometimes dead and sometimes living organisms derived from different strains often of doubtful parentage, of different agglutinating capacity cultivated on different media, for different periods of time, at different temperatures, and last but not least, of using different standards for positive and negative results."

In a paper on the Theory of Agglutinin Estimation, by Wakelin Barratt,[8] it is shown that the reaction between the agglutinin and its antigen was observed at 37 C, to be in fair agreement with the equation $yt=m$, where $y$=concentration of the agglutinin holding serum employed: $t$=time of appearance of agglutination, $m$=a constant. He also emphasises the fact that the agglutination proceeds more rapidly with the rise of temperature, a maximum being reached at 55° C. In view of the importance of time, temperature, and other factors, taking into consideration the fact that the Garrow technique is carried out at room temperature and that the time employed in the technique is only three minutes, it is submitted that the higher standard positive titres as obtained by Ledingham,[9] Douglas,[6] Walker Hall,[10] Fildes,[11] Dean,[12] Glynn,[7] and their co-workers, and by Rajchman and Western,[13] varying from 1/50 to 1/125, by various methods, and various times and temperatures, do not necessarily exclude the possibility of the lower titres given by the Garrow technique being of diagnostic importance.

In this connexion, it is much regretted that for purposes of comparison it was not practicable to adopt one of the standard methods used by the aforementioned observers, and particularly that time did not permit of making a preliminary observation of the agglutinin titre given by normal serum by the Garrow technique. On the other hand, a considerable number of blood sera of non-dysentery patients were examined in the course of routine work, but in no instance did a blood serum in dilution of 1/10 agglutinate emulsions of the *B. dysenteriæ* group. Further, Broughton-Alcock[14] had pointed out that in dysentery infections, as the agglutinin content of blood sera developed during bacillary dysentery is small, a lesser dilution than 1/10 was found necessary. Frequent and comparative tests of varied dilutions showed him that the dilution of 1 in 6 of blood serum, and three or four minutes time limit given, gave more reliable results in bacillary dysentery cases. In addition, the following considerations weighed with me in taking a dilution of 1 in 10 of intestinal exudate as my lowest diagnostic standard. In view of the intestinal flux in bacillary dysentery, supposing the seat of antibody formation to be in the intestine, the titre would be low, and probably the severer the infection the lower would be the titre against the infecting organism. If the seat of antibody formation was not in the intestine, the majority of cases were so early that the blood serum, and therefore the intestinal exudate, would give a result either negative or positive only in low dilutions.

Whilst I agree that it is of the greatest importance not to be misled by the normal agglutinins of blood sera, it seems to me that it is also of importance not to fix too high a diagnostic standard, lest that in avoiding the one error the other be made of dismissing as of no importance the titre given by sera or exudates which fail to reach an unduly high diagnostic standard. Taking these matters into consideration, my opinion is that even as low a titre as 1 in 10 as obtained by the Garrow technique is of value from a diagnostic point of view.

Another matter calling for consideration is the presence of agglutinins to the typhoid group of organisms in the intestinal exudate. Practically all the men from whom these stools had been obtained had been inoculated with T.A.B. vaccine, and on the whole the titre of the intestinal exudate corresponded closely with titres obtained from the specimens of blood sera examined in the course of routine work. In a few cases absorption tests were made on the intestinal exudate, and it was clear that these agglutinins were vaccine agglutinins. These vaccine agglutinins were of great assistance indirectly because they enabled one to have a fairly accurate knowledge of the composition of the intestinal exudate from the point of view of its admixture with fluids such as urine, &c. As already mentioned, they served to show the extent of dilution in those stools composed of mucus which were shaken up with saline in order to obtain sufficient fluid for examination. If these vaccine agglutinins had not been available for control purposes it would have been necessary to ascertain the end agglutination point of normal serum for a micro-organism by the Garrow technique, and to include this organism in testing each intestinal exudate. It may be mentioned that the presence of these vaccine agglutinins in the intestinal exudate indicated that it would have been possible to determine the occurrence of a mixed dysentery and enterica infection (such as was believed to be present in some of the Gallipoli cases) if the enterica infection had existed sufficiently long to produce agglutinins in the blood stream.

As typhus and cholera were endemic in the area round Jerusalem, from time to time the intestinal exudates were tested against emulsions of the cholera vibrio and emulsions of *B. proteus* (X 19), but with negative results. In addition to the vaccine aggl-u-

tinins, in cases of Shiga infection, co-agglutinins to the *B. dysenteriæ* Flexner were encountered from time to time, but as these were present in lower titres than those given by the specific infecting organism no difficulty arose on this account. In connexion with the agglutination of the concomitant non-lactose-fermenting organisms it is possible that group agglutination might explain some of the results, but in others where a high titre was obtained such an explanation cannot hold.

The hypothesis on which this investigation was based had its origin from a consideration of the well-known pathological facts concerning bacillary dysentery, but in 1919 Besredka,[15] of the Pasteur Institute, published an account of the experimental investigations he had carried out in connexion with the mechanism of infection in typhoid, paratyphoid, and dysenteric infections. He succeeded in killing several rabbits by giving them killed cultures of the Shiga bacillus by the mouth, subcutaneously, and intravenously. However infected, by the blood-stream or by the subcutaneous route with living cultures, or with killed cultures, or endotoxin, the animal reacted only by its intestinal apparatus. His experiments led him to the conclusion that the immunity is established in the intestine at the site of the lesions following the first ingestion of the bacillary bodies.

My view is that the intestinal exudate, although subject to extraneous additions modifying its titre, is the fluid "par excellence" for the examination of antibodies to the *B. dysenteriæ* and its concomitant organisms, and while recognising that my investigations are incomplete these notes are published in the hope that some observer with time and material at his disposal will investigate the matter more fully, especially in view of Besredka's researches. My belief is that the examination of the antibody content of the intestinal exudate in bacillary dysentery is of great value from the point of the laboratory worker, dependent as he often is on a specimen of stool only and often sorely pressed for time and assistance when dealing with epidemic dysentery. Dudgeon[16] states that under the most favourable conditions a competent bacteriologist can determine whether an infection is due to the Shiga or Flexner bacillus in 12 to 16 hours, and adds that this fact is of little value under the conditions that exist with an army in the field. By an examination of the intestinal exudate, using Garrow's technique, recognition of the infecting organism may be obtained in 12 to 16 minutes. From a therapeutic point of view this method makes it possible to employ a pure anti-Shiga, or a pure anti-Flexner serum at the earliest opportunity (a desideratum emphasised by Dudgeon), and further to follow up such treatment by employing anti-sera or vaccines prepared from such concomitants demonstrated to be operative in any given case, as elicited from an examination of the intestinal exudate.

*Summary.*

This paper deals with an attempt made to ascertain whether the examination of the fluid portion of dysentery stools would afford information as to the nature of the dysenteric infection. It is based on the argument that in bacillary dysentery specific antibodies to the *B. dysenteriæ* would be present, whereas in amœbic dysentery, caused by a protozoal agent, such bacillary antibodies would be absent from the intestinal exudate; the intestinal tract being the seat of infection, the fluid exudate would contain a larger antibody content at an earlier date than the blood serum, and therefore an early diagnosis could be made. The antibody investigated was the agglutinin. Details of technique and the results obtained both in early and in late cases are given. Agglutinins were found to be present in low titre, and their significance is discussed. Besredka's researches showing that the immunity in bacillary dysentery is established at the site of the intestinal lesions are quoted, and in view of Besredka's findings the hope is expressed that the intestinal exudate may receive attention from laboratory workers with the view of ascertaining whether a method may be established which has the advantages of simplicity and rapidity and of involving the minimum of laboratory equipment. It is submitted that this method affords an additional means of dealing promptly with an outbreak of dysentery from the points of view of diagnosis and treatment and is of special value in adverse surroundings.

I am deeply indebted to Captain William Rutherford, M.C. (O.C. No. 3 Military Laboratory) for his unfailing generosity and good comradeship during the difficult time of May-June, 1918. To Captain R. P. Garrow I wish again to express my thanks for his invaluable technique, and my thanks are given to Colonel H. S. Anderson, C.M.G. (O.C. Citadel Military Hospital, Cairo), and also to Major Charles Kerr. To Major A. R. Ferguson, O.B.E., and to Colonel Carmalt-Jones I am grateful for their encouragement, and also to my Director, Prof. R. Tanner Hewlett, for his help and advice in preparing this paper.

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# CHEESE POISONING:

## WITH SPECIAL REFERENCE TO THE DOVER OUTBREAK.

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OUTBREAKS of illness following the consumption of cheese are events of great rarity in this country. An outbreak which was clearly traced to cheese occurred in London in 1901, but the majority of recorded outbreaks have been in America. The main features of cheese poisoning from the ætiological and clinical sides resemble those of poisoning from other infected foods, but one or two minor points of difference might be indicated. In the first place the case-mortality rate is lower. From the records which are available, comprising many hundreds of cases, I have been unable to find evidence of a single fatal case in any outbreak where the circumstances incriminating cheese have been at all conclusive; whereas in other food-poisoning epidemics the case-mortality rate is in the neighbourhood of 1·5 per cent. Secondly, the incubation period tends to be rather shorter in cheese poisoning; and thirdly, the usual food-poisoning organisms are hardly ever found in epidemics due to cheese.

### *The Nature of Cheese Poisoning.*

When we come to consider the nature of cheese as a food an explanation for these differences becomes apparent. Cheese occupies a unique position among our foods. It is the only article of food in this country which, manufactured many weeks or months before it is intended for consumption, is not subjected to any process of preservation during that period. Moreover, bacterial action, causing proteolytic and other changes, so far from being inhibited, is encouraged along definite channels in order to bring about ripening. It would seem very unlikely, therefore, that in the event of pathogenic micro-organisms being introduced into a cheese in process of manufacture, such organisms would remain alive at the time of consumption, having regard to the conditions of temperature, &c., being favourable to an enormous overgrowth of the sapro

phytic bacteria and moulds associated with the ripening process and unfavourable to the growth of pathogenic organisms.

We know, however, that organisms of the Gaertner group—the bacilli almost invariably associated with this type of food poisoning—produce an extremely stable toxin, capable of withstanding a temperature of 100° C. for five minutes, or more, without being destroyed. It would seem likely, then, that this toxin would remain unaltered during the ripening process, while the micro-organisms from which it was derived were overgrown and killed by the multiplication of saprophytes.

Cheese poisoning, therefore, viewed from this standpoint, would be a pure intoxication, as distinct from poisoning in which other articles of food are the vehicle, where there is usually a combination of intoxication and infection with Gaertner organisms. This explanation is, of course, in the regions of hypothesis, and further research is necessary to confirm it, but in intoxication as distinct from infection one would expect: (1) a shorter incubation period; (2) a milder attack, with fewer fatal cases; (3) rapid recovery following elimination of toxin; (4) recurrence of symptoms on ingestion of second dose of toxin. In the Dover outbreak which occurred in July of this year these points are very clearly brought out; furthermore, the evidence incriminating cheese is most definite and convincing.

### *The Dover Outbreak.*

On Saturday, July 1st, 1922, the first cases of poisoning made their appearance. The symptoms, the details of which will be described later, were, in the main, abdominal pain, diarrhœa, and vomiting. Forty-three families, comprising 126 individuals, were discovered to have been attacked in this way, most of the cases occurring on the morning of Sunday, July 2nd. As far as I am aware, no fresh cases arose after July 5th. The outbreak was confined to a small district, within the Borough of Dover, entirely inhabited by the working-class. In every one of the 126 individuals who were affected the symptoms commenced a few hours after a meal at which cheese had been eaten. In every case the cheese had been purchased from the same shop, and no other article of food was a feature common to all the cases.

During the course of the investigations, the manager of the shop in question informed me that a new imported cheese was first cut on the late afternoon of Friday, June 30th. It was on sale all the following day and the last of it was sold out on Monday morning, July 3rd. Only those individuals who ate cheese purchased from this particular shop between these hours were affected. This particular cheese, moreover, possessed a rather distinctive appearance, being very dark, almost red in colour, somewhat resembling the colour of Gloucester cheese; accordingly, it was not difficult to trace its connexion with every case investigated. Other cheeses were on sale at the same shop during the same hours, notably a white imported "Cheddar" cheese, but no ill-effects could be traced to these, nor to any other article of food, cooked meats, &c., purchased from this shop.

The cheese was one of a batch of "red Canadian Cheddar" cheeses, shipped from Montreal to a wholesale house in London, whence it had been sent to Dover about a week before the outbreak occurred. The weight of these cheeses is in the neighbourhood of 80 lb., and as the peccant cheese was completely sold out in pieces averaging about 1 lb., or rather less, it follows that it must have found its way into at least 80 households, in only 43 of which it was subsequently traced. In appearance, taste, and smell the cheese seemed perfectly sound and wholesome. A few minute holes, spherical as though formed by bubbles of gas, were noted in pieces of the peccant cheese which were not seen in other cheeses of the same batch.

The shop was a general store, dealing chiefly in grocery and provisions. The members of the staff were examined to exclude the possibilty of one of them being a carrier. They were all in good health and had not been in contact with any cases of sickness. It was fairly apparent from the start, however, that a carrier hypothesis would not account for the outbreak, as the poisonous effects were confined to a certain definite cheese, and were not shared by any other food, cooked meat, brawn, &c., sold in the shop. All circumstances seemed to point to the cheese having become contaminated in process of manufacture. To trace the cheese back to the farm in Canada where it was produced has so far proved impracticable, and so, as in so many recorded outbreaks, the last link in the chain of evidence is missing. Every house in which a case of poisoning occurred was visited by me personally, and the history was elicited from the various members of the family, who were encouraged to tell the story in their own words, leading questions being avoided as far as possible. The similarity of the history in the different houses visited was most striking.

The following typical cases are quoted to indicate the convincing evidence against the "red" cheese, and to illustrate some of the clinical and ætiological features referred to in the text.

CASE 18.—Mr. Y., aged 30, Mrs. Y. (30), their daughter (7), with Mr. and Mrs. Z. (26 and 21) sat down to a supper of bread, butter, cheese, and cocoa on July 3rd at 9.30 P.M. At 6 A.M. the following morning Mrs. Y. was awakened with severe abdominal pain followed by diarrhœa. About 7 A.M. the child was seized with very bad abdominal pain, vomiting, and diarrhœa, and about an hour later Mr. and Mrs. Z. complained of the same symptoms. They felt so ill that all remained in bed for the day. Mr. Y., who had eaten no cheese for supper, remained perfectly well. The cheese (red) was bought at the X stores on July 1st.

CASE 12.—Mr. and Mrs. Q. (aged 47 and 44 respectively) had supper of cold lamb, bread, and cheese; and their two daughters bread and cheese only at 10.30 P.M. on July 1st. About 6 A.M. the next morning Mrs. Q. and one daughter were seized with severe pains in the abdomen, vomiting, and diarrhœa. Shortly afterwards Mr. Q. and the other daughter were similarly affected but did not vomit. On the 3rd the married son and daughter-in-law of Mr. and Mrs. Q. returned home from holiday, and at 9.45 P.M. had supper of bread, butter, and stout. The daughter-in-law ate in addition some of the same cheese. At 5.30 A.M. the next morning the daughter-in-law had very violent pains, diarrhœa, and vomiting. The son remained perfectly well. "Red" cheese bought at X stores, evening of June 30th.

CASE 10.—Three sisters, A. (51), B. (40), and C. (62) ate a meal of boiled mutton, potatoes, cabbage, and gooseberry pudding, followed by cheese at 12.30 P.M. on July 3rd. At 4 P.M. A. was taken ill with colic, which doubled her up, severe diarrhœa, and vomiting. She became very weak, pale, and collapsed, and "thought she was going to die." After a few hours the acute symptoms abated. At 10 P.M. B. had a similar attack but of less severity. About the same time C. complained of mild abdominal pain and a little diarrhœa. All ate very little and approximately equal amounts of cheese. On the 5th A., not suspecting the cheese, ate some more, and had a return of the pain. "Red" cheese bought at X stores on July 1st.

CASE 7.—Mr. O. (72), Mrs. O. (71), I. I. (9), and G. E. (20) had supper of bread and cheese at 9.30 P.M. on July 1st. In the early hours of the following morning the first three named were awakened with violent abdominal pains and diarrhœa, and Mrs. O. and the boy, I. I., with vomiting also. G. E., who had eaten more cheese than any of the others, remained entirely unaffected and completely free from any symptoms throughout. On the 2nd, at 9.30 P.M., F. I. (30) ate some bread and cheese and complained the following morning of a little diarrhœa and some mild pain in the abdomen. "Red" cheese bought at X stores on July 1st.

### *Ætiology.*

*Age and Sex.*—All ages and both sexes were indiscriminately affected, and no relationship could be established between either of these factors and the severity of the attack or the length of incubation period.

*Season.*—In food poisoning epidemics, seasonal prevalence is very marked, the vast majority occurring in June, July, and August. The Dover outbreak is no exception to this, although the significance in this case is a little vague, as there is no evidence at present available to determine when the cheese was infected.

*Infectivity.*—Out of a total of 135 individuals, who were known to have eaten the peccant cheese, only 9

(6·7 per cent.) remained in good health and free from the symptoms of poisoning. The infectivity rate is, therefore, very high (93·3 per cent.).

*Severity of Attack.*—As has been found by most investigators in food-poisoning outbreaks, no relationship could be traced between the severity of the symptoms and the amount of peccant food eaten (see Cases 7 and 10). It seems very probable that symptoms were the result of preformed toxic substance in the cheese and not of ingestion by the victims of a food-poisoning organism. If this is so, the absence of relationship between severity of attack and amount of cheese eaten would argue either an uneven distribution of toxin throughout the cheese, or a varying degree of tolerance among the victims.

*Incubation Period.*—The incubation period was very short. The longest discovered in this outbreak was only 11 hours, the shortest 3½ hours. The average incubation period lay between 7 and 8 hours.

*Recurrences.*—These are of some interest, and three such cases occurred in the Dover outbreak. These three individuals, after recovery from the initial attack, and not suspecting the cheese to be the cause of their illness, ate some more, and after another short incubation period these persons suffered from a second acute attack, similar to the first (see Case 10). In two of these cases, the secondary illness was milder than the primary, while in the third it was of greater severity.

Another type of illness was observed, also where the cheese was not suspected—the continued type. Here very mild symptoms were produced, a little abdominal pain and looseness of the bowels during the days the cheese was being eaten. These symptoms persisted until the cheese was finished when they ceased. Seven such cases were discovered, one of which culminated in an acute attack of great severity.

*Mortality.*—No deaths occurred in this outbreak.

### *Clinical Condition.*

*Pain.*—Abdominal pain was a constant symptom, being complained of in every case without exception. In the majority of instances the pain was severe, paroxysmal in type, described generally as "cutting" in character and causing the patient to double up or to roll about in an endeavour to find a position of ease. The intensity diminished after two or three hours, but it was reported in many cases that spasmodic pains tended to recur at intervals for the following day or two, especially soon after food. A small proportion of those affected were able to carry on with their work, but in most cases the severity of the pain caused them to give up and take to their beds or to lie down.

*Diarrhœa.*—This was the next most constant feature, being present in 89 per cent. of all cases. This likewise varied in degree and frequency, but in a few cases the loss of tissue fluid by the bowel was so profuse as to give rise to obvious "pinching" of the features and shrinkage of the limbs, which were remarked upon. Cramp in the calves was not complained of.

*Vomiting.*—This was present in 63 per cent. of cases, and nausea among many of the remainder. A feeling of sickness and a distaste for food, sometimes accompanied by an unpleasant taste in the mouth, generally persisted for 48 hours.

*Prostration.*—This was a most marked clinical feature. A few of the sufferers recounted very accurately the symptoms of collapse during the acute stage—extreme weakness, pallor, cold sweat, palpitation and rapid breathing, and fear of impending death—but every individual examined remarked on the debility which followed the acute attack and which lasted for three or four days.

*Fever.*—Most of the patients complained of feeling "feverish" during the attack. The only three cases seen by me in the subacute stage had temperatures of 99·2°, 99·2°, and 99·6° F. respectively. The last-mentioned had a temperature of 98·6° two days later.

*Rash.*—Noticed in only one case. A woman, highly neurotic, described a blotchy nettle-rash, which appeared suddenly 48 hours after the onset of symptoms, and which was distributed all over the body. It was accompanied by intense itching and nausea, and disappeared within 12 hours.

*Nervous Symptoms.*—Palpitation and weakness have already been mentioned, and one man described, in a recurrent attack, flashes of light before the eyes.

### *Laboratory Investigations.*

For the following results I am indebted to the experimental work of Dr. W. G. Savage and Mr. P. Bruce White, carried out in connexion with the research investigation on food poisoning which is being undertaken for the Medical Research Council in coöperation with the Ministry of Health.

*Chemical Examination.*—A thorough examination of the samples for tyrotoxicon was negative. Search was made in cheese and rind for arsenic, antimony, and other poisonous metals, but no trace could be found.

*Bacteriological Examination.*—Examination of the cheese and of fæces, urine and vomit of sufferers, by aerobic and anaerobic methods on various media offered no clue. No organisms known to be associated with food poisoning were found. From one sample platings gave 2–3 colonies of Morgan's No. 1 bacillus. Serum from sufferers failed to agglutinate any organisms of the Gaertner group.

In some of the continental and American outbreaks the infective properties have been ascribed to toxic substances produced by special types of *B. coli*. In the cheese under consideration *B. coli* strains were present, as in many normal cheese samples, but direct examination yielded no evidence that they or their products were toxic by feeding. As further evidence of the absence of living toxin-producing bacteria, it may be mentioned that sound cheese, inoculated with an emulsion from the infected cheese, and incubated under various conditions, remained non-toxic to mice.

### *Feeding Experiments.*

(*a*) *Mice.*—Mice are definitely susceptible to the "toxin"; but in the series of experiments performed the results were irregular (perhaps indicating an irregularly distributed poison). In some cases the effects were noted within 24 hours of the first meal; in others, symptoms did not appear until after several days of feeding; in yet others no symptoms were noted throughout (8–10 days). The symptoms shown by the affected mice were: Soft but not liquid stools; apparent paralysis or weakness of the hind legs, causing the animals to walk "splay-footed," in some cases the animals became wet and ceased to care for their appearance; two mice died with spasmodic movements of the whole body, and others showed tremors. Post mortem, two of the mice showed marked hæmorrhage of the gastric and intestinal mucosa. In others, minute petechial hæmorrhages were seen. In several cases the spleen was seemingly enlarged. The mice were carefully examined for infecting organisms. Aerobic and anaerobic cultures of the intestinal contents and organs led to the conclusion that Morgan's No. 1 bacillus was the only organism that could be regarded with any suspicion. In many cases this organism was found in large numbers in the stomachs of the affected mice, and occurred (sometimes in pure culture) in the spleens of several. Knowledge of this organism, however, strongly suggests that it is a secondary invader, following on some primary alimentary irritant. Further, the same organism was isolated from the stomach of one of the control mice.

(*b*) *Rabbits.*—A rabbit was twice "force-fed" with large doses of the suspected cheese. It was totally unaffected. Subcutaneous injections of cheese emulsions into guinea-pigs and rabbits brought out nothing of importance.

(*c*) *Human.*—Mr. Bruce White ate a mixed sample of cheese, about 5 g., at 9.30 P.M., and was awakened about 4.30 A.M. with nausea and headache. Nausea and headache continued throughout that day, but had more or less disappeared the following morning. Alcoholic extracts of the cheese prepared at room temperature, and residue from alcoholic extraction were separately consumed on

several occasions without ill-effect. Aqueous extracts, prepared by extracting cheese at 52° C. for 48 hours, were taken without ill-effect. An extract was then made at room temperature with grinding and shaking for 20 minutes. A quantity of this extract, corresponding to 7 to 8 g. of cheese, was consumed, and after several hours considerable discomfort was felt which persisted for two days.

From these feeding experiments on whole cheese and extracts the pathological experts conclude: (1) That mice and humans are susceptible, rabbits not; (2) that the poison is not alcohol-soluble and is probably destroyed by alcohol; and (3) that the poison is water-soluble, but that in solution it is probably destroyed by a temperature of 52° C. acting for 48 hours.

These several points suggest that the poison is in the nature of a protein or true "toxin."

*Summary.*

1. The Dover outbreak was not due to inorganic poisons, to tyrotoxicon, nor to the infection of the victims with a food-poisoning micro-organism.

2. The outbreak was almost certainly due to a bacterial toxin.

3. The close resemblance of the Dover outbreak, clinically and ætiologically, to a Gaertner-group infection, suggests very strongly that the *toxin* of a Gaertner-group organism was the cause of the Dover outbreak.

4. Such delicate organisms as those of the Gaertner group, introduced during the process of manufacture, would be unlikely to survive maturation of the cheese, although their stable toxin would doubtless persist.

5. Considerations referred to in the text point to toxin of a Gaertner-group bacillus being the usual cause of those outbreaks of poisoning in which cheese is the vehicle.

My thanks are due to Dr. A. B. McMaster, medical officer of health, Dover, for permission to publish these observations, and for his valuable criticism.

# Medical Societies.

## ROYAL SOCIETY OF MEDICINE.

### SECTION OF SURGERY.

THE RISE AND FALL OF SURGICAL OPERATIONS.

AT a meeting of this section of the Royal Society of Medicine, held on Nov. 1st, Mr. JAMES BERRY delivered his presidential address on the Progress of Surgery and the Rise and Fall of Surgical Operations. He said that during his surgical life he had witnessed the most wonderful progress in surgery that had ever taken place in so short a time.

As a student he saw the last of the pre-antiseptic days. Since then he had watched the development of antiseptic surgery, and later still the gradual development of the aseptic régime, under which so many of the greatest advances of modern surgery had been made. In the eighties operative surgery of the skull and brain consisted of little more than the trephining and elevation of depressed fractures and the occasional (and usually fatal) opening of a cerebral abscess. Deep dissecting operations at the base of the neck were rarely performed on account of the dangers, in those days, of opening up the cellular tissues. Thoracic surgery was almost limited to the opening of empyemata, and abdominal surgery was in its infancy. The then existing fear of opening the peritoneal cavity was fully justifiable, for he had seen a man die of acute peritonitis after a trivial operation upon the abdominal wall, which had involved a small opening of the peritoneum. Hysterectomy in those days was done with a wire écraseur, and cancer of the tongue was removed by the barbarous chain or whipcord écraseur. Lithotomy was usually performed by the perineal route, and lumbar colotomy was being replaced by the inguinal operation, then not infrequently followed by such accidents as the prolapse of the bowel and the escape of small intestine into the bed owing to the insufficient closure of the abdominal wound. It was a truism that most of the progress made in surgery was due to the application first of antiseptic, and later of aseptic, principles to the treatment of operation wounds. He remembered seeing surgeons of eminence operating in old frock-coats, splashed and stained with blood and pus; the more dirty the coat, the greater seemed to be the pride of the surgeon who wore it. The surgeon of those days might not even wash his hands before undertaking an operation.

*Value of Pathology to the Surgeon.*

The success of many of the highly technical present-day operations depended not merely on skilful technique and strict asepsis, but also in a thorough knowledge of the pathological conditions likely to be met with. The lack of this knowledge might easily lead to a fatal disaster. Cholecystectomy, for example, was a very successful operation in the hands of skilled surgeons, but much judgment was required to know when it should be performed, and when the simpler operation of cholecystotomy would be preferable. A cholecystectomy that would be the right operation in a particular case for a Moynihan or a Mayo, might be the wrong operation for Mr. A. or Mr. B. A slight error in the placing of the suture in a gastro-enterostomy, the careless application of a single ligature in a thyroidectomy, the incorrect placing of a clamp in a cholecystectomy might easily lead to the death of the patient. There was no such thing as the mortality of such and such an operation, for that depended upon the condition for which it was done, upon the operator who did it, and how and when it was performed. With our greatly increased accuracy in diagnosis, and better knowledge of pathology and technique, it had now become possible to penetrate with impunity to regions of the body which formerly no surgeon would have dared to approach. Extensive operations upon the bladder, the intestine, the stomach, the biliary passages, the lungs, the thyroid, and the brain were among the wonders of modern surgery.

At one period of his career Mr. Berry was surgical registrar for more than five years to one of the largest London hospitals, and at the same time full surgeon to another large hospital. It was part of his duty as surgical registrar to perform all the surgical post-mortem examinations, an experience which he found invaluable when operating on the living subject. He could not help feeling that the modern practice of entrusting surgical post-mortem examinations to a pathologist who was not interested in small matters of surgical detail, so important to the operating surgeon, was, in some respects, a retrograde step. The loss to the young surgeon of this valuable post-mortem room training was surely obvious. After a year or two in the anatomy department the young aspirant to a surgical career should soak for several years in pathological museums, in operating theatres, and in post-mortem rooms. He must learn his anatomy and surgical pathology thoroughly. He must watch the performance of innumerable operations, and see thousands of clinical cases before he was really fit to practise first-class general surgery. He must be prepared to have in his earlier days a hard time, for he should not expect to do much surgical practice of a remunerative kind until he had had 10 or 20 years of hard work at learning the elements of his profession.

*Operating in the Presence of Sepsis.*

While the results of aseptic operations were brilliant he (Mr. Berry) questioned whether we could congratulate ourselves as much upon the results of operations undertaken where sepsis already existed, more especially in acute suppurative conditions of the abdomen. In these cases it was far more difficult for the young

operator to acquire the necessary experience for their correct treatment. By visiting the great surgical centres we could learn from the great masters of surgery, but the master could not arrange an afternoon in which he would operate upon, say, a fulminating appendicitis, a perforated gastric ulcer, a strangulated hernia with gangrenous intestine, and an acute intestinal obstruction. Experience of such operations was of the utmost importance, and only by long and assiduous attendance at hospitals could the young man acquire such experience. An operation which he thought was now too frequently performed was the operation for appendicitis. While the majority of such operations were easy of performance and almost devoid of danger, there remained a minority in which the operation might be very severe and difficult. He thought most harm was done when the case was not seen until late, especially in those cases where abdominal distension had already set in. The operation risk was undoubtedly considerable in such cases, and he wondered whether it was sufficiently realised that most of these cases would not die if not operated upon, and that a few days' delay often put the patient into a more favourable condition for operation if that should prove necessary. He pleaded that in all such cases the question of operation should be judged upon the merits of that particular case. Fifteen years ago he had expressed the view that if we were all to go back to the old treatment of appendicitis that was in vogue 25 (now 40) years ago there would be a lesser mortality from appendicitis than there is at present.[1] By "all" he meant not merely all hospital surgeons but all who operate for appendicitis. Fifteen years of further experience had confirmed him in the view he had formerly expressed. He did not suggest that the experienced surgeon should not operate for acute appendicitis, or even that there were not many cases in which immediate operation was imperative. But he thought that much more care should be taken in the selection of cases for operation as regards both time and manner.

It was commonly believed by both the public and the profession that the custom of operating freely for acute appendicitis had resulted in great saving of life. In that case deaths from appendicitis should be less common than they used to be, unless one held the view, as some boldly did, that appendicitis was a disease that was becoming increasingly frequent, and there was no clear evidence of this. Various tables referring to appendicitis, gastric ulcer, intestinal obstruction, and peritonitis, compiled from the Registrar-General's returns, were exhibited, which tended to show, so far as statistics could do, that deaths from appendicitis had in fact increased. He offered these figures as food for serious reflection and did not claim anything more for them. Statistics might be very misleading and wanted very careful examination. But these figures, if they meant anything, tended at least to show that the mortality from appendicitis has not diminished since the custom of operating for acute appendicitis has been so widely prevalent. Great eraccuracy in diagnosis and in registration would accountf or some but not, he thought, for all the increased mortality.

*England and Wales: Total Deaths from Appendicitis and Perityphlitis.**

| Period. | Male. | Female. | Total. |
|---|---|---|---|
| 1901–05 .. .. | 4873 | 3418 | 8,291 |
| 1906–10 .. .. | 6299 | 4587 | 10,886 |
| 1911–15 .. .. | 7260 | 5480 | 12,740 |
| 1916–20 .. .. | 6827 | 5591 | 12,418 |

* During the same periods the total deaths from peritonitis (non-puerperal) showed a decrease of 3305. Even supposing that all such cases originated in acute appendicitis, there would still be a small margin of increase in deaths from appendicitis when the periods 1901–05 and 1916–20 were compared.

*Effect of War Conditions.*

It was frequently stated that the war had produced great advances in surgery, and in many ways this was true. Great improvements had been made, for example, in the treatment of septic wounds and compound fractures, and brilliant results had been obtained in plastic surgery and military orthopædic surgery. But in other respects the war had had a harmful effect, for many dangerous operations were now being undertaken by men whose qualifications consisted of a few years' practice in military surgery —the surgery of injuries—upon young and healthy men. Such experience alone did not qualify an operator to deal with civilian surgery such as that of the breast, cancer of the tongue, tumours of all kinds, diseases of the biliary passages, of the stomach, colon, prostate, &c. Yet all over the country practitioners with little more than military experience of surgery were performing operations for such conditions as Mr. Berry had enumerated. If the case were a straightforward one which could be dealt with by a text-book operation all might go well, but it might easily fare ill with the patient if some unexpected difficulty or complication arose for which the operator was unprepared. Since a skilled and well-trained surgeon was available in nearly every large town in England Mr. Berry thought it obviously unwise for the inexperienced practitioner to undertake extensive operations except in cases of great urgency.

The student who had seen the modern surgeon at work was only too apt to think that he has only to exercise surgical cleanliness to be able to perform the largest and most dangerous operations of surgery. And if, after qualifying, he were fortified only by a few years of war surgery, he would find the practice of operative surgery not quite so easy as he had imagined. He might, for example, perform operations for inguinal hernia successfully until he came across a puzzling case and when he had opened the bladder he would learn what this condition looks like in the living subject.

*Spheres of General Surgeon and Specialist.*

Relating to the question of where the sphere of the general surgeon ended and that of the specialist began, Mr. Berry related the following: Some years ago, in the days when gynæcologists were beginning to operate, he went into an operating theatre where an elderly gynæcologist was at work. This operator's previous training had been that of a physician, except for the knowledge of surgery that he had acquired from his surgical colleagues who had helped him in his earlier operations. On this occasion he was in a state of considerable excitement and struggling to remove a retroperitoneal tumour on which he had already placed a number of clamps. From Mr. Berry he inquired the nature of the tumour; one glance sufficed to show that it was a solitary horse-shoe kidney, which no one with any training in anatomy and pathology could have failed to recognise. He tied off the vessels which he had already severed and closed the wound. At the autopsy next day it was found that both renal arteries and both ureters had been divided before the mistake was discovered. This was a tragic instance of a man's straying into a field of practice which really did not belong to him. On the other hand, general surgeons who strayed into the field of the gynæcologist were apt to make such errors as tapping the pregnant uterus in mistake for an ovarian cyst. Mr. Berry had even seen the urinary bladder opened by a general surgeon in mistake for an ovarian cyst, and with a fatal result. Both these cases occurred more than 25 years ago.

Mr. Berry hoped that he would not be thought unkind in relating the mistakes and failures of other surgeons, some of whom were his teachers, whose memory he cherished with respect and affection. Indeed, he hoped that some pupil of his, warned by his mistakes and failures, might utilise this knowledge for the benefit of a new and more perfect generation. The address concluded with a quotation from Sir Frederick Treves on the subject of "the good surgeon." Mr. Berry's favourite definition of the "good surgeon" was "one who always knows when to put in, and when to take out a drainage-tube."

[1] THE LANCET, Sept. 7th, 1907.

*Discussion.*

Sir JOHN BLAND-SUTTON said it was a new departure to permit discussion of the Presidential Address. As an indication of the number of practitioners who now operated, he pointed out the ready sale commanded by the many books on operative surgery, whereas 40 years ago no such books existed. The mere reading of books, he thought, constituted but a poor method of learning operative surgery. In these days there were more house surgeons trained in London than could be absorbed into purely surgical practice, and many of them went into general practice. In the country such men often made up a team of say a general surgeon, an anæsthetist, a gynæcologist, and a laryngologist, and ran a private nursing home with the assistance of a well-trained nurse. Often such a team did well, but he would warn them that at any time an operator might be faced with a severe ordeal, such as had occurred in his own practice. Twenty-five years ago he operated for a supposed cystic tumour of the kidney. Being in some doubt as to the nature of the tumour he made an incision into it. Blood gushed forth violently with a whistling sound, for he had opened an aneurysm of the abdominal aorta. He succeeded, however, in suturing the incision in the aneurysm, and the patient made a good recovery and was alive three years afterwards. He would warn the general practitioner who embarked upon surgery that even minor operations might lead to major disasters.

Sir W. ARBUTHNOT LANE thought that the question of who was, and who was not, properly qualified to operate would soon be settled by the public. This was especially true of small towns in the country, where news of a fatality from operation led to the cessation of all practice for the surgeon concerned in that locality, as the Mayos had discovered in America. If that was the case in America, the same would hold good in this country, for the American general practitioner was accustomed to refresh his knowledge of surgery from time to time at the great clinics in this country and the Continent, and was therefore at an advantage compared with his English brethren.

Mr. A. W. SHEEN, as an instance of the rise and fall of a surgical operation, referred to an operation he had performed for microcephaly. The patient recovered, although without much benefit; some months later he (Mr. Sheen) read in an Italian work that such an operation constituted a "stain upon the hands and a blot on the soul" of the surgeon who performed it. He considered that the "follow-up" of the results of surgical operations was of extreme value; and he was inclined to think that all was not so well with patients after such simple operations as those for hernia, hydrocele, varicocele, &c., as we were apt to believe. As regards the training of surgeons, he had been impressed by the work done by officers in the I.M.S., who had had no special surgical training, when called upon of necessity to do major surgery with poor equipment and inadequate assistance. For the benefit of persons who had to operate under such circumstances he appealed to the writers of text-books to describe operations so that anyone with ordinary surgical knowledge could perform them.

## CAMBRIDGE UNIVERSITY MEDICAL SOCIETY.

A MEETING of this Society was held on Nov. 1st, when Dr. B. H. SPILSBURY read a paper on the

*Criminal Court and the Medical Witness.*

He said that he elected to discuss the position of the medical witness in the Criminal Court rather than the Coroner's Court, because in the latter the medical man is regarded as an expert, whereas in the former his evidence and his knowledge is certain to be severely tested. It was almost certain that every medical practitioner would at some time be called upon to give evidence in a court of law. Medical jurisprudence, he said, is a means whereby all the knowledge acquired in a course of medical study is brought to the aid of the law. Consequently it is a subject attacked only just before the final examination, though it certainly dates back to the Mosaic Law, and has grown more or less contemporaneously with medicine and science. But inadequate training, and great difficulty of practical teaching, and a corresponding lack of interest in the subject, have caused it to make very slow progress. The essential foundation of a knowledge of this subject is a familiarity with the principles of chemistry, physics, anatomy, and physiology. Many medical witnesses of the present day are unsuited to give evidence, as they have largely forgotten the facts and the application of physiological principles to the problems. For example, a completely severed artery is a less immediate danger to life than a partly cut one. For in the latter case the high pressure of blood inside the artery keeps the wound circular and as large as possible. Blood escapes very quickly and soon leads to a fatal result. But in the former case the elasticity of the artery causes it to retract, and the walls of the vessel thicken in consequence. Also it is possible that a muscle has been severed, which would also retract and thicken, and would help to close up the ends of the artery so checking any further loss of blood. In such a case it may be possible for life to be saved. A case is vouched for by two French medical authorities, in which a criminal lived for 1½ hours after he had been guillotined. Although his head had been completely removed the heart received sufficient blood and continued to beat. He did not die immediately from loss of blood, because of the retraction and contraction of the muscles and arteries in the neck. Although in many cases the medical evidence is comparatively unimportant, it is often a vital factor in criminal investigation, particularly in a certain class of case. Supposing that a servant girl has got into trouble, someone attempts to bring about an abortion, and as a result she dies of blood poisoning. The medical evidence is often alone responsible for the detection of this class of criminal. Furthermore, it is essential for the medical witness to ascertain all the facts in any crime and to draw, and be prepared to state, his conclusions from them. He is not compelled by duty to do so, but he is materially assisting the law if he does.

Dr. Spilsbury then mentioned four interesting cases which he himself had investigated. The first one was the case of a man who worked for an insurance company, which at the time was being attacked in a weekly paper. This had evidently upset the man's mental balance. He was found dead by the roadside early one morning with his throat cut and a copy of the paper in one hand. He was evidently insane at the time of the act, but the flow of blood had brought him to his senses. He tried to stanch the wound with a handkerchief, and walked for some distance in the direction of his doctor's house, before he eventually died through air entering a cut vein and causing a stoppage of the heart. The next case was one of murder. Two sergeants lived together in a hut in an Australian camp near Aldershot; one of them was found dead in bed. A service rifle lay beside him. Careful investigation showed that a bullet had passed through his head, through the hut wall, and on to the ground outside. From this evidence the direction of the bullet could be traced. It was found to have been impossible under these circumstances for the man to have shot himself, and the case was established as one of murder. Then came the case of the three brides in the bath. The successive wives of a certain man had been drowned in a bath in analogous circumstances. On the occasion of the death of the last wife, the man was found in the bath-room in a condition which proved that he had been exerting some physical force. The lecturer went on to point out that had due importance been given to details at the inquiry into the first case suspicion must have fallen on the husband, and possibly his career of crime cut short. It was shown that death was probably due to shock caused by the sudden passage of water up the nose. In the last case described a

medical man was charged with the death of a woman while attempting to procure an abortion. The woman had visited him one afternoon and was found dead a short distance from his house early the next morning. A post-mortem examination revealed the fact that death could only be due to the shock experienced at the passage of an instrument into the womb. Dr. Spilsbury concluded his lecture by saying that he could quote many more cases in which medical evidence had played an important part; but he hoped that he had said enough to arouse in the minds of medical students at Cambridge some enthusiasm for the subject of medical jurisprudence.

## LIVERPOOL MEDICAL INSTITUTION.

A MEETING of this institution was held on Oct. 26th, Dr. J. HILL ABRAM, the President, in the chair.

Dr. J. C. M. GIVEN read a paper on

*Recent Discoveries in Palæontology.*

He discussed the difficulties felt by some authorities in the reconstructing of Piltdown man, especially the combination of the marked chimpanzee-like inferior maxilla with a human cranium. Dr. Given went on to describe the Rhodesian skull, saying that the geological evidence did not point to extreme antiquity, but its form was primitive and ape-like and it presented in a marked degree some of the characters of the Neanderthal race. He pointed out the supposed evidence of mastoid disease and the fact that this was denied by Elliot Smith to be ante-mortem. Dr. Given concluded by discussing the Nebraska tooth, with the hypothetical new genus of homo, built on its supposed human origin, and also alluded to its importance, if authentic, on the early origin of man in America.

Dr. W. JOHNSON read a note on

*Drug Therapy in Disseminated Sclerosis.*

He dwelt on the necessity of treatment in the early stage of the disease, before the nervous system had become riddled with plaques of sclerosis. He reviewed briefly the symptoms which usually occurred first, and were frequently regarded as hysterical. A not uncommon history was that of a slight pyrexial attack followed by vague paresis, paræsthesia, temporary diplopia, or misty vision. Subsequently, marked improvement occurred until a new attack followed with a fresh exacerbation of symptoms. Such a series of remissions in the course of a progressive nervous disorder was almost diagnostic of disseminated sclerosis. During the past two years ten early cases of the disease had been treated with intravenous injections of novarsenobillon. An initial course of six weekly injections (0·15 g., 0·3, 0·45, 0·45, 0·6, and 0·6) was given. This was repeated six months later. In between the two courses and subsequently for a year liq. arsenicalis was given by the mouth. Such a line of treatment has seemed to stay the progress of the disease, but observation over a longer period was necessary before any conclusions could be drawn. The first suggestion for this form of treatment came from Dr. Farquhar Buzzard.

Dr. T. R. GLYNN said that unfortunately it appeared that treatment to be successful must be adopted in the early febrile stage. The recognition of the affection in that stage must be difficult and depended rather on the ability of the general practitioner rather than that of the specialist or physician.

Dr. JOHN OWEN referred to the difficulties attending early diagnosis. He read a communication from Dr. A. Ransome, who had treated 26 cases of disseminated sclerosis of a standing ranging from two to five years and over. He employed silver salvarsan intravenously —a total of 664 injections. His results were as follows: 4 were much improved, 8 no change, 2 died of intercurrent disease, 1 died of cancer. The course of treatment extended over two years.

Dr. A. DOUGLAS BIGLAND stated that he had not seen the early cases described by Dr. Johnson. The only early symptoms usually referred to by patients were temporary diplopia, temporary loss of vision and precipitate micturition. He agreed that early diagnosis was of the utmost importance and emphasised the value of spinal fluid examinations. A metic or paretic curve with Lange's goldsol test together with a negative W.R. was very suggestive of disseminated sclerosis.

Mr. H. C. W. NUTTALL read a paper on

*Tuberculosis of the Sacro-Iliac Joint.*

He reviewed the literature of the subject and gave records of nine cases for eight of which he was indebted to Prof. Thelwall Thomas. He considered that the treatment advised in most text-books was often not radical enough and that Picqué's operation was suitable in many cases. Mr. Nuttall discussed the anatomy and pathology of the joint and expressed the view that this supported the necessity for more radical methods. He reviewed the clinical facts and the differential diagnosis of the condition, and described in detail Picqué's technique, illustrating this by lantern slides.

Mr. T. P. MCMURRAY stated his opinion that the operation of Picqué was a great advance on those previously employed and led to a much greater chance of cure. He had operated on six of these cases by a modification of this method, which consisted in the turning over of a hinged bone flap from the back of the ilium across the gap left after excision of the joint. This led to bony union and increased the stability of the pelvis.

## SHEFFIELD MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on Oct. 26th at the King Edward VII. Hospital, Sheffield, a hospital devoted to the treatment of bone and joint tuberculosis in children. Dr. RUPERT HALLAM, the President, took the chair.

Dr. C. LEE PATTISON, the medical superintendent, demonstrated some of the cases in the hospital, and showed the methods adopted and the apparatus used in the treatment of various types of joint and bone tuberculosis; the special plaster room was visited.

Dr. PATTISON then read a paper on

*The Local Treatment of Acute Tuberculous Disease of the Hip-joint and Vertebræ.*

He laid emphasis on the fact that tuberculous joint disease is merely one local manifestation of a general disease, and deprecated the radical measures that had been adopted formerly in the treatment of these conditions. He was an ardent upholder of the conservative methods as laid down by Menard, Calvé, and Calot in France, and by Sir Henry Gauvain in this country. Complete immobilisation and the prevention of muscular spasm were the essentials in treatment on which attention should be concentrated. In the hip-joint, in addition to extension in the axis of the limb, Dr. Pattison had found lateral extension in the axis of the femoral neck very useful. When the spasm of the muscles had diminished and the limb was in good position, and there was no sign of abscess formation, immobilisation was maintained best by fixation of the limb in a plaster-of-Paris splint. In the vertebræ, tissue destruction and the effects of muscular spasm in producing a kyphotic deformity might be minimised by fixing the patient in a recumbent position with a pad exactly under the spinous processes of the affected vertebræ. Aids in the carrying out of this treatment were obtained by utilising some type of "swinging back door" or the "wheel-barrow" splints. Extensions might be fixed to the head or lower limbs if necessary. He thought that Albee's operation was justifiable in adults only where time was absolutely essential, and was definitely contra-indicated in children. Abscesses should be treated by aspiration, repeated many times when necessary; the details of the technique of the operation were described and the advantages of the various modifying liquids enumerated.

The PRESIDENT, Mr. J. B. FERGUSON WILSON, Mr. E. F. FINCH, Mr. MILES PHILLIPS, and others took part in the discussion which followed.

# Reviews and Notices of Books.

CONSTIPATION.

*Studien über Darmträgheit (Stuhlverstopfung): ihre Folgen und ihre Behandlung.* Second edition. By F. X. MAYR. Berlin: S. Karger. 1920. Pp. 266. M.24.

IN view of the great amount of clinical experience of a special kind which falls to the lot of a physician at a fashionable spa, it is surprising how small is the serious medical literature which such practice has produced. Dr. Mayr's thoughtful and painstaking volume on constipation, which has now come to a second edition, will do something to remove this reproach. Upon the foundation of a practice at Carlsbad, and guided by a thorough knowledge of the physiology of the alimentary tract, he has written an interesting and instructive account of the causes, conditions, and results of sluggishness of the intestines, particularly from the theoretical and clinical aspects. Of what is called clinical or experimental pathology, chemical, bacteriological, or radiological, there is little or none, less indeed than would be found in any recent text-book. These modern aids to medicine are hardly invoked; and the point they can give to accuracy of diagnosis and treatment is obviously not realised. Not that the book is unscientific; far from it. But laboratory work is regarded as a guide to the formation of sound theory and not as a daily help to the practising physician. Nevertheless, the book is well worth reading and possessing, for careful clinical observation and deduction are and must remain of first importance in the practice of medicine.

The anatomical and physiological first part leads up to a study of over-activity and under-activity of the bowel, their causes and immediate results. The constant segmenting movements of the small, and in less degree of the large, intestine mix the intestinal contents and thus aid digestion and absorption. In addition they carry on the portal circulation, for by these contractions the bowel wall empties itself of blood and ensures the continual flow of fresh blood through its walls and into the portal vein. Hence an atonic intestine means stasis of blood in the liver. This result of atony is not commonly recognised, and it may well account for a good part of the symptoms nowadays ascribed to absorption of toxins. Stress is laid on the observation that if the passage through any part of the bowel is hindered, or there is irritation or inflammation, then a veto is laid upon the segment above. Hence constipation, when it becomes uncontrollable, affects the whole alimentary tract in due course. Dr. Mayr is doubtful whether actual retrograde peristalsis occurs, although he has observed the passage backwards of material. The observations quoted, however, are almost entirely made by palpation and percussion and cannot compare in accuracy with those of the X ray screen. The physical signs described when there is distension of the intestine with gas are interesting. The author states that in normal digestion gas cannot be percussed in the large intestine in any quantity. In the recumbent position a resonant note should be obtained only over the fundus of the stomach. Even in fat people, if recumbent, the abdomen should be retracted; prominence means gaseous distension and is a sign of stagnation. The small intestine is generally responsible for the frequent resonance to the right of the umbilicus and up towards the liver. The resonance is too broad to be due to the colon and it does not usually extend to the left of the middle line; the ascending colon can also be often felt through the resonant area.

The most valuable and interesting part of the book is comprised by the 90 pages in which the author describes the results, immediate and remote, of delay in each part of the bowel. This section is vigorous and convincing, and is illustrated by accounts of cases. The reader finds himself drawn gradually into believing that constipation is the root of most alimentary evils, as well as of many disorders in other systems of the body. This is a tribute to the enthusiasm of the author, who brings forward much to support his views. The evidence that diabetes is due to intestinal stasis and disappears with its relief is, however, unconvincing. The cases quoted are mild and inadequately observed, and the percentage only of sugar in the urine is stated. No other observations on the urine are mentioned and no blood-sugar estimations. Further, many of the diagnoses arrived at by patient clinical observation extending over weeks or months—e.g., of inflammation of the transverse colon—could be reached, and more accurately, by X ray examinations lasting a couple of days. Diverticula of the large intestine are just mentioned, but the frequency and importance of diverticulosis is not recognised. The section on intestinal auto-intoxication is sane and well worked out. The author has no use for surgical procedure for stitching up or removing an atonic bowel. Indeed, his argument and his cases show how unscientific such procedures are, unless the bowel be proved incapable of recovering its tone.

The section on treatment is disappointing because the detail is inadequate; the author explains that every case requires individual treatment, but gives no full account of the treatment of even one patient. The general instructions, however, are scientific and reasonable, and the harm done by constant aperients is made abundantly clear. The most valuable means of restoring the tone of the bowel, according to Dr. Mayr, is massage of the bowel, carried out by the doctor himself. Diet helps, but, he thinks, only by stimulating the bowel like a mild aperient. We would suggest that any regular healthy increase of intestinal movement, such as is brought about by stimulating diet, causes the bowel, by the author's own showing, virtually to massage itself. Dietetic treatment has the further advantage that the patient can carry it on at home when he has left the spa.

We can cordially recommend this book. Any reader will rise from it with considerable additions to his knowledge. If in the next edition the bacteriology of the subject received attention, and the author made himself acquainted with modern experimental work, including that of British and American radiologists, the value of the work would be further increased.

BACTERIOLOGY: GENERAL, PATHOLOGICAL, AND INTESTINAL.

Second edition. By ARTHUR ISAAC KENDALL, B.S., Ph.D., Dr.P.H., Professor of Bacteriology in the Northwestern University Medical School, Chicago, Illinois. Philadelphia and New York: Lea and Febiger. 1921. Pp. 680. $6.

IN the preface to this edition the author states that the upheaval in bacteriology caused by the war has been a main factor in the demand for a revision of the book. With his opinion that not all of the recently included matter will stand the test of time we agree. The effort to be encyclopædic, while acknowledging sources of the information which the book contains, has the result of giving it too much the aspect of a compilation and of obscuring and swamping any personal gospel which the author may have to preach to his readers. The endeavour to follow all the ramifications of the subject has produced a strained effect and may leave the reader in confusion as to what is established fact and what is extremely debatable theory. Moreover, the book swarms with minor inaccuracies and curious omissions. Thus we find no mention of McIntosh and Fildes's jar for the culture of anaerobes, nor is the Ehrlich test for indol included. The section on the *Micrococcus ovalis* is brought up to date, but we find the erroneous statement that "its resistance to chemical and physical agents is about the same as that of the streptococcus"; in the same section a table from a recent article is quoted, showing the action of this organism on seven sugars, and is immediately followed by the statement that "acid is produced in glucose and lactose broths; the action on other sugars

is yet to be determined." In the chapter on streptococci a classification is given which is essentially that of Andrewes and Horder, but it is wrongly attributed to Holman. The chapters on the typhoid and colon groups are rather weak. Dulcitol is not mentioned amongst the differentiating sugars, and the existence of two types of *B. typhosus* is allowed on the unsafe grounds of a late change towards alkalinity in milk. In addition to inaccuracies of this kind there are abundant printer's errors—e.g., Marmork for Marmoreck on p. 270; hæmoglobinurea for hæmoglobinuria on p. 271; *B. typhosus* beta for *B. paratyphosus* B in the table on p. 317; mannose for mannite on p. 357; Stockmann for Stockman on p. 379, &c. One of the best sections in the book is that on the anaerobic bacteria, which has been revised with considerable thoroughness. It is a pity that minor errors, due probably to careless revision, have been allowed to creep into an otherwise painstaking valuable book whose price is by no means negligible.

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ARCHIVES OF NEUROLOGY AND PSYCHIATRY.

From the Pathological Laboratory of the London County Mental Hospitals, Maudsley Hospital, Denmark Hill. Edited by Sir FREDERICK MOTT, K.B.E., M.D., F.R.S., Director of the Laboratory and Pathologist to the London County Mental Hospitals. Vol. VIII. 1922. Published by the London County Council. 31*s.* 6*d.*

THE eighth volume of the Archives of Neurology and Psychiatry contains a record of the work carried on in the laboratory of the Maudsley Hospital during the last three years and includes some 17 contributions, of which no less than ten come from Sir Frederick Mott alone or in collaboration. Here will be found collected in convenient form the Morison Lectures (1921) on the psychopathology of puberty and adolescence, the Maudsley Lecture (1921), the elaborate studies in the pathology of dementia præcox (already published in the Proceedings of the Royal Society of Medicine), and other no less important contributions to scientific medicine. Dr. F. L. Golla's Croonian Lectures (1921) also find a place in the Archives. The only papers not previously published are those by Dr. J. A. Gilfillan and Mr. S. A. Mann on typhoid carriers in mental hospitals, and some chemical papers by Mr. Mann on the examination of the blood, cerebrospinal fluid, and urine, in epilepsy.

The output from the London County Mental Hospital Laboratory bears continued witness both in quantity and quality to the undiminished enthusiasm and industry of its distinguished Director, who, when affairs psychopathological are admittedly in a state of uncertainty, never deviates from his fundamental position, that the surest way to advance in mental disease is via the route indicated by the study of morphological, experimental, and chemical pathology. The solid learning embodied in this eighth volume satisfies the inquiring mind as no amount of psychological speculation can ever do.

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ENDOCRINE GLANDS AND THE SYMPATHETIC SYSTEM.

By P. LEREBOULLET, P. HARVIER, H. CARRION, and A. G. GUILLAUME. Translated by F. RAOUL MASON, M.D., Instructor in Pediatrics, New York Post-graduate Medical School and Hospital. With the collaboration of DANIEL R. AYRES, M.D., Assistant Professor of Gynæcology, New York Post-graduate Medical School and Hospital, &c. London and Philadelphia: J. B. Lippincott Company. 1922. Pp. 378. 25*s.*

THE inter-relation of the endocrine glands and the sympathetic nervous system stands in need of much further investigation and elucidation ere conclusions of clinical significance can be safely drawn. The study of each is in its infancy, and sober reflexion not infrequently rejects the facile deductions of uncritical theorists. In this English edition of the volume written by Dr. Lereboullet and others we note a certain hesitation in accepting widely credited statements, a certain caution in advancing opinions, which are all to the good. The book as a whole, none the less, is rather unsatisfactory. Notwithstanding its title, there is little attempt to link in a consecutive fashion the two divisions; the description of glandular syndromes follows accepted lines and gives little indication of original research; the section on pluriglandular syndromes is sketchy and somewhat reminiscent of a catalogue. Dr. Guillaume's contribution on the anatomy and physiology of the sympathetic nervous system suffers similarly from its conciseness; and the chapter on organotherapy is valuable largely because of its revelation of the insecure basis on which the practice of treating all and sundry symptoms is erected.

Not a few errors in proper names and an occasional too literal translation detract from the readableness of the book. In several of the diagrams (notably Figs. 22, 24, 25, 26) there is a curious medley of French and English descriptive terms and an inaccuracy as between the diagram itself and the legend beneath.

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PHARMACOLOGY AND MATERIA MEDICA.

*A Manual of Pharmacology and its Applications to Therapeutics and Toxicology.* Second edition. By TORALD SOLLMANN, M.D., Professor of Pharmacology and Materia Medica in the School of Medicine of Western Reserve University, Cleveland. London and Philadelphia: W. B. Saunders Company. 1922. Pp. 1066. 32*s.* 6*d.*

IT is hard to produce a book which can serve both for study and for reference. The writer relies on the division into larger and smaller type, the latter to be ignored by the reader who wishes to obtain merely a general knowledge of pharmacology. In his own words, the book contains the broad conceptions and generalisations and some detailed conclusions which are of great and practical importance to every student and practitioner; and it also contains a large mass of minute details which would constitute too great a tax on human memory but which cannot safely be neglected.

We find the book an excellent one, but with nearly 1000 pages of text it is not to be recommended to the unqualified student. It is suitable for any practitioner who has the time, taste, and energy to read deeply, and it is, moreover, a book of reference in which the laboratory worker may find a summary of great practical value to him. Its great size is mainly due to the large number of drugs, of methods of essay, and of methods of treatment which receive mention. Occasionally the author gives a subject disproportionate space, as in the case of mustard gas, but this rarely occurs. The large-type text is simply worded, and the physiological bases on which pharmacology rests is successfully dealt with. The small-type part contains the history of individual drugs and short accounts of the work on which our present knowledge of them is based. These accounts are individually models of conciseness. Taken altogether the mass of detail in the small type may worry a general reader.

This pharmacological book written by an American will be found strikingly readable by the Englishman; that effort which is usually necessary in view of the difference of pharmacopœias and measures used in the two countries is not needed. Perhaps, when both countries use the metric system, an "English-speaking" pharmacopœia may be possible, presenting no difficulty on either side of the Atlantic.

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*Ghosh's Treatise on Materia Medica and Therapeutics.* Ninth edition. By B. H. DEARE, C.I.E., Professor of Medicine, Medical College of Bengal, and Dean to the Faculty of Medicine, University of Calcutta; and BIRENDRA NATH GHOSH, Examiner in Pharmacology, University of Calcutta. Calcutta: Hilton and Co. 1922. Pp. 712. 10*s.* 6*d.*

THIS is a sound manual on pharmacology and therapeutics, prepared for the Indian student. First published in 1901, it is, in its present ninth edition,

well up to date, though modelled on the old manner of pharmacological text-books. By this we mean nothing disparaging. The modern book tells us first of physiology and pharmacological experiment, it may tell us of therapeutic application; at the end of the chapter it gives, almost with an apology, a list of pharmacopœial preparations. The old style is to give lists of characters, compositions, official and non-official preparations, and then to finish up in large type with pharmacology and therapeutics. The weaknesses of this style are that the early "dry" parts are too full and that the pharmacological parts are usually not quite up to date. The new-fashioned style may help the student to think, but the old style gives facts which help him to pass examinations as they are still held, and which afford material for prescriptions. This book is a good sample of the old style of text-book.

*Pharmacopœia of St. Thomas's Hospital.* Compiled by J. A. JENNINGS. London: H. H. G. Grattan, and the Bookstall, St. Thomas's Hospital. 1922. Pp. 176. 3*s*.

THE strength of the St. Thomas's pharmacopœia is in its simplicity and in the admirable explanatory notes attached to many of the drugs and preparations. It is edited for the student and the young practitioner, and conveys the impression that the writer has been asked questions so often as to know where difficulties arise. There is nothing cold and formal in this little book: it is just a useful companion. The poison and antidote pages give many valuable hints and may well be copied. We suppose it is hospital usage to have an ABC lotion of carbolic acid and borax, but it may easily lead to confusion with the well-known liniment of aconite, belladonna, and chloroform, and the initial letters are not really in alphabetical order. This is the most homely and friendly of all the hospital pharmacopœias we have seen.

ELECTRICITY.

*Science in the Service of Man: Electricity.* By SYDNEY STARLING, A.R.C.Sc., B.Sc., F.Inst.P., Head of the Department of Physics in the West Ham Municipal College. London: Longmans, Green and Co. 1922. With 127 illustrations. Pp. 245. 10*s*. 6*d*.

THE object of this book is to describe the uses of electricity in the service of man and to explain, without the aid of mathematics, the physical principles involved. After a brief résumé of the history of the subject the author describes the principles of the electro-magnet and their practical application in the construction and use of such apparatus as the electrical bell, the magnetic brake, and the electric clock. Chapters are devoted to the dynamo and electric motor, their principles and construction, and the methods of supplying current on the mains. Another chapter deals with the alternating current, its production and its uses for such purposes as the working of motors, the welding of metals, and the like. Electric illumination, the telegraph and the telephone, high-frequency currents and their production, are described clearly, also the electro-magnetic waves and wireless telegraphy. Radiology is the subject of the last two chapters. High potential discharges through rarefied gases and the production of cathode rays, X rays, and canal rays are discussed; the nature and properties of these rays are explained, and the various radio-active substances and the nature of their emanation are described.

The great advances which have been made in physics during the past 80 years have been closely associated with the study of mathematics, and their practical application has resulted in discoveries which have been of inestimable use in the arts and in the service of man in general. There are many who wish to know something more about wireless telegraphy, X rays, and radium than the slender facts that are common knowledge, but they are deterred from further inquiry by the fact that text-books dealing with these subjects present them largely from their mathematical aspect. The present book will render a service to such inquirers. It describes the physical principles in a manner that can be understood by those who are not acquainted with higher mathematics. The meaning of scientific and technical terms is explained in a glossary at the end of the book.

Medical men, especially those who studied physics long ago, will find the book very useful at the commencement of their study of radiology and electrology. Knowledge of physics and electro-technics is, of course, essential for those who wish to specialise in medical radiology and electrology, and it can be obtained from books on these subjects, but many of the chapters in this little volume could be read with profit, as a useful preliminary introduction, by those who are beginning their study.

*Rays of Positive Electricity and Their Application to Chemical Analyses.* Second edition. By Sir J. J. THOMSON, O.M., F.R.S., Master of Trinity College, Cambridge; Professor of Experimental Physics, Cambridge. London: Longmans, Green and Co. Pp. 237. 16*s*.

THE early studies upon the electrical discharge through rarefied gases, culminating in the Crookes tube and Rontgen's discovery of a new type of radiation, have yielded a scientific harvest which grows with each succeeding year to such dimensions that at the present time this yield is no longer the subject of study by anyone in its entirety. The radiation effects now form an elaborate study, with ramifications and practical applications in many directions; the electrical properties of one particular discharge tube—namely, the thermionic valve, form the basis of action of one of the most striking electrical instruments at the disposal of the physicist, and the book before us gives a detailed and elaborate account of certain rays, the positive rays, which are under special conditions generated when an electrical discharge takes place in rarefied gases. This type of radiation consists of atoms or molecules of the gas which carry a positive charge of electricity. They have practically none of the properties of X rays, and indeed only merit the name ray because they constitute a stream of moving particles, very similar, for instance, to the alpha rays from radio-active substances. But the fact that they are in motion and carry an electrical charge has been put to good account, dating from their discovery by Goldstein in 1886. The main additions to the first edition of this book concern the development of a line of investigation initiated by Sir J. J. Thomson himself.

These researches, carried on by Mr. Aston at the Cavendish Laboratory, have brought into practice a new method of chemical analysis, which has revealed the fact that many substances previously thought by the chemist to be single substances are really mixtures. To such substances, alike in every other chemical respect, the name isotrope has been given. The various conditions under which the positive rays are produced, their properties and the light which their study has shed upon atomic and molecular structure, are related in detail in this book, and come from a source whose authority is unquestioned.

## JOURNALS.

AMERICAN JOURNAL OF OPHTHALMOLOGY. August, 1922.—W. S. Franklin and W. D. Horner: Hernia Through Tenon's Capsule with Extrusion of Orbital Fat, a Birth Injury. This is an account of a case which is probably unique as far as published reports go. The infant had been delivered with forceps and the skull was fractured at birth. The eyes could not be seen for three months on account of swelling. The case was seen at the age of 5½ years when the eyes were normal in every respect except for the presence of subconjunctival fatty tumours in both eyes. The condition was remedied surgically by excising the tumours and suturing the rent in Tenon's capsule on both sides.—I. Hartshorne: Lympho-sarcoma of the Orbit, Probably Arising in the Choroid.—I. Bram: Exophthalmos in Exophthalmic Goitre; a Study of

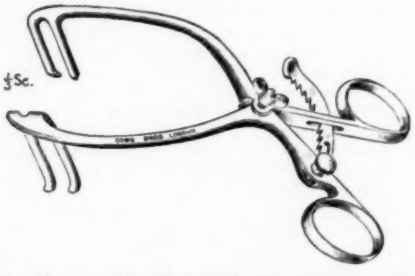
400 Cases. This article contains 36 figures illustrating the various degrees of exophthalmos. Out of the whole number there was no exophthalmos in 9¾ per cent., it was slight, or appearing on attention only in 27 per cent., moderate in 23 per cent., marked in 19¼ per cent., and extreme in 7 per cent. In 14 per cent. it was asymmetrical, being absent or less marked in one eye than the other. With regard to the goitre, it was absent in 19½ per cent., slight in 22 per cent., moderate in 27¾ per cent., marked also in 27¾ per cent., and extreme in 5 per cent. As is well known, neither of these symptoms is essential to the diagnosis of the disease, the common nomenclature of which implies that both are present. The degree of exophthalmos bears no definite relation to the severity of the disease. In asymmetrical cases there is no relation between the side in which the goitre is most developed and the side in which the exophthalmos is most marked. Except in extreme cases where there is difficulty in closing the lids, the rôle of the ophthalmologist is almost limited to the correction of errors of refraction which may constitute a contributing cause.—J. M. Patton and S. R. Gifford: Agricultural Conjunctivitis. Under this title the authors describe a type of conjunctivitis unique in their experience. Six cases were seen in 12 months, all in outdoor workers, some unilateral, but all severe and leaving corneal scars, and in some instances conjunctival adhesions. In four out of the six cases the following features were present; enormous swelling of the lids, swelling of the regional lymph glands, superficial necrosis of the skin of the lids, and a membrane on the conjunctiva. The remaining two, though not displaying all these features, were sufficiently similar to warrant their inclusion as atypical cases. Mixed infection was present in all cases, the streptococcus, staphylococcus, *B. xerosis*, and a large Gram-positive anaerobic bacillus being found. The last is considered to have an ætiological relation to the cases. They were not due to the infection of diphtheria, though bearing considerable resemblance to these cases. Treatment is most unsatisfactory, being almost limited to hot applications. The application of strong silver salts is likely to do more harm than good in the stage of swelling, and even irrigation must be performed with great care lest the cornea should be injured.—H. S. Gradle: Bilateral Blood Staining of the Cornea. In cases where the anterior chamber is full of blood the cornea occasionally becomes stained with a product of the decomposition of hæmoglobin. In this case the staining was bilateral and followed a double iridectomy for old iritic adhesions. As a rule, in these cases of blood staining the eye is lost, but in this case better vision was ultimately retained in one eye than before operation.—Among the notes in this number there is a case which is interesting from the point of view of the pathology of cupping of the disc. In a case of double glaucoma after wood-alcohol poisoning, the tension was successfully brought down by operation, but the eyes were blind. At the time of operation the cupping was only slight. Subsequently, although the tension remained continuously low, the cupping increased until it measured 4 dioptres. What was here the mechanism that caused the cupping?

IN the JOURNAL OF THE R.A.M.C. for October, Dr. H. M. Woodcock sets out to answer the question: Are the Active Principles of Filter-passing and "Ultra-microscopic" Viruses Living Organisms or Enzymes? He shows beautiful sketches of microscopic preparations, some stained by Giemsa, some with iron-hæmatoxylin, to prove that the granules sometimes claimed as "ultra-microscopic" organisms are not really organisms at all, but products of the disintegration (karyorrhexis) of the nuclei of cells. These granules stain red with Giemsa, yet are not granules of chromatin for they do not stain at all with iron-hæmatoxylin. Dr. Woodcock goes on to urge that in all cases where filter-passing organisms are thought to be concerned the observed facts may be better explained by a theory that a pathological ferment action occurs.—The paper on Senescence and Senility, a clinical account of the ailments of the old veterans at Chelsea, by Majors R. J. C. Thompson and R. E. Todd, R.A.M.C., appeared in THE LANCET, 1922, i., 874. —Captain J. F. Bourke writes on the Military Economy of a Regiment in 1768, basing his paper on a book of that date by the adjutant of the 5th Regiment. Men were to be recruited, if possible, between the ages of 17 and 25, and only accepted if between 5 ft. 6 in. and 6 ft. in height. They must not suffer from fits, rupture, knock-knee, flat-foot, or skin disease. When a regiment moves "into Cantoonments (note the spelling) or Camp" a house should be hired as the regimental hospital. The regiment made a deduction from each man's pay to cover the cost of his ration; if the man became sick the deducted money was paid to the surgeon, who seems also to have received an allowance from each man for drugs, and was then responsible for the care of men who fell out on the march and had to be left behind under the care of "a careful sober Privateman" and a selected civil medical practitioner, under the oversight of the civil magistrate. If regiments were with an army patients sent to the hospital of the army should be accompanied by the surgeon's mate, or at least a medical account of their cases should be forwarded with them. Quarters must be kept clean, tents struck for two hours at midday that the straw may dry. On shipboard the decks after they have been cleaned are to be washed with vinegar. It is observed that regiments which put men under stoppages when suffering from venereal disease have fewer men in hospital than have others. Distinction is made between the officer's servant who takes care of him, and his bât-man (bât=pack-saddle) who looks after the pack-horse which carried the officer's kit.—Lieut.-Colonel C. R. L. Ronayne completes the story of his journey round the world in a cargo steamer. He is much struck with the difference between the Suez and Panama Canals. In Egypt ships are moved by tugs, at Panama by electric locomotives, running on toothed rails alongside, "worked by electricity of 40,000 voltage—in fact, everything is done by electricity, bar the shouting, and that's not done at all, so perfect is the organisation."

# New Inventions.

## A CHEEK RETRACTOR FOR TONSIL OPERATIONS.

IN the removal of tonsils by dissection (Waugh's method) retraction of the cheeks will greatly improve the view of the field of operation. The cheek retractor here illustrated, which has been in regular use in my



clinic for three years, is merely the instrument known as a "self-retaining abdominal retractor," of which the blades have been bent so that when in use as a cheek retractor the handle may lie beneath the chin and out of the way of the operator and anæsthetist. The mouth-gag is inserted in the ordinary manner, and the tongue is drawn outwards and steadied by a towel-clip which may be hooked over the thumb-screw of the retractor.

Messrs. Down Bros. are the makers of the instrument.

DOUGLAS GUTHRIE, F.R.C.S.
Edinburgh.

# THE LANCET.

*LONDON: SATURDAY, NOVEMBER 11, 1922.*


## The Chemical Arrest of Cell Growth.

YET another line of attack upon malignant growths and their cure is inaugurated by Prof. BLAIR BELL, whose preliminary communication, the result of several years' work, we publish in this issue of THE LANCET. That communication is eloquent concerning the difficulties of the attack, nor at first sight do the tabulated results of the treatment encourage the belief that at last we have reached the sure solution of one of the greatest problems of modern medicine. Fifty cases treated during the last two years out of which only four are tentatively regarded as cured as compared with 21 deaths, 13 within seven weeks after commencement of the treatment, 8 at a later period: these are figures which seem to announce defeat, not victory. Nevertheless, on following his argument, weighing the facts upon which that argument is based, and again after studying certain of his case-histories, it is not possible to arrive at any other conclusion than that Prof. BLAIR BELL has opened up a line of attack that deserves to be prosecuted. The modern theory of cell intoxication is that particular orders of cells exhibit a selective affinity for, and absorb, particular molecules, and that, whether by adsorption or by chemical union, the presence of certain exogenous molecules arrests the normal metabolism of these cells and so brings about their disintegration. In this way we explain the action of narcotics such as ether and chloroform taken up by tissues and cells rich in fats and lipoids, and the destruction of spirochætes by salvarsan and other arsenic compounds. It is a distinct step forward to attempt to bring about the death of cancer cells by this means. It is possible that future investigations will reveal some agent more specific than is lead. But all will recognise the logical sequence of Prof. BLAIR BELL's investigations.

The most striking example of physiological malignancy in the human body is to be seen in the invasion and destruction of the maternal uterine tissues by the chorionic epithelium of the fœtus. Studying the induction of abortion in the lower animals he found that the well-known abortifacient, lead, has a definite action upon the chorionic epithelium. Accordingly, he applies this knowledge to cases of pathological malignancy. Those other lines of attack which since the beginning of the century have met with success, even if this be but partial, are each of them based upon the same principle of bringing about the arrest of growth and the subsequent disintegration of the tumour cells. In the action of radium, X rays, and diathermy what is sought is the destruction of the growth by physical means. The defect of all three methods is that they can only be applied locally. Prof. BLAIR BELL overcomes this defect by introducing intravenously a chemical substance capable of arresting the growth of tissues in a state of active proliferation. Given intravenously it reaches the metastases equally with the primary growth. That his argument has a sound basis is, according to him, demonstrated by the fact that tumour masses removed after treatment are found to contain the substance, lead, in notable amounts. Granting this, it will be admitted that the action of lead is far from being specific. It is well known that introduced into the human body it is specially liable to affect the nervous system, the red corpuscles, the vessels, and the essential organs of generation. The problem, therefore, was not unlike that which confronted EHRLICH in the matter of arsenical preparations—a problem of *therapia magna sterilisans*—that, namely, of discovering what preparation of lead would convey the metal into the system in the largest amounts with the least injury to the tissues other than those composing the malignant growths. He now announces that colloidal lead fulfils the conditions, but evidently is still undecided as to which menstruum for its conveyance into the venous system is to be recommended.

In justice to himself it may be urged that Prof. BLAIR BELL should have waited until the experimental stage of his inquiry was completed, and until he had met and successfully countered every difficulty, until he could publish the full details of the treatment, the mode or modes of exhibition of the medium, and the extent and intervals of dosage as suitable for cancer and sarcoma, for slowly growing and acutely malignant neoplasms respectively. We must, however, realise that Prof. BLAIR BELL finds himself in a dilemma. He has naturally at first treated cases that with rare exceptions had been pronounced hopeless for ordinary surgical treatment, cases with short expectation of life, willing to place themselves under him as a last resort. With such he must have been prepared for a heavy mortality. It is clear from what he writes that progressively he has gained some knowledge of the limitations of his drug. He has evidently learnt that too small doses have a stimulating instead of a destructive effect, that too large doses act deleteriously on the normal tissues of the body, particularly on tissues which normally undergo active proliferation; as also that where the tumour is of large size the absorption of the disintegration products of the tumour cells on a large scale under the influence of the metal is capable of producing a dangerous, not to say a fatal intoxication; that to avoid this it is better to remove the main mass of a large growth by surgical means prior to intravenous injection of the metal; that these injections have a lowering effect, rendering it inadvisable to undertake surgical operations while the injections are proceeding; and that in some cases the employment of X rays following upon the injections gives better results than does either treatment alone. Reading between the lines it is further implied that Prof. BLAIR BELL has some doubts as to the effectiveness of lead in causing the arrest and disappearance of the more chronic, scirrhous, and non-vascular forms of carcinoma.

There is needed now a series of early cases, while it is difficult for him, even with all the safeguards provided by his reputation and University position, to treat such cases without publishing the nature of his practice and of the drug employed. Obviously he is dealing with edged tools, and with a due regard to his responsibility to the profession and to the public he asks—for this is what the present communication signifies—that while thus giving a general description of his method and the results obtained, he be not required to publish the details of his procedure—details which are not as yet standardised—until an adequate number of cases of malignant neoplasm has been treated, sufficient to take the matter beyond the experimental stage. And his committee of experts support him. We fully sympathise with Prof. BLAIR BELL in his difficulty. The very fact that he is a

gynæcologist renders it essential that if his treatment is to be tested upon male patients he must take their medical men into his confidence to as large a degree as possible. He cannot, therefore, continue his tests satisfactorily without some considerable amount of publicity. He should test the method not upon one or two cases of sarcoma, but upon a long series of different forms of connective-tissue tumours before he can arrive at any generalisation. Similarly, he should be able to report upon not a few but several cases of the main types of carcinoma, both epithelial and glandular. The very fact that the treatment is not specific, but on the contrary is beset with complications and grave dangers, makes us assent to his plea that the originator be permitted time and opportunity to test its limitations before publishing the minutiæ of his procedure.

## Economics and Health.

AT a recent meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine, Dr. R. J. EWART read a challenging paper on Economics and Tuberculosis in which he proposed to sustain two theses, of which the first—namely, that a principal factor of the decline of tuberculosis was economic in character—led to a lively discussion. It is common ground that under-nutrition of the body is a predisposing cause of first-rate importance, dramatic testimony being provided here by the recent experience of central Europe and Poland. Dr. EWART showed that the movement of the death-rate from tuberculosis has corresponded with the movement in the value of real wages, an increase of the latter having been uniformly associated with a decrease of the former. Since no such parallelism could be found between the mortality curve and the proportion of employed trade-unionists, Dr. EWART contended that English Poor-law administration was so efficient, on the average, as to enable the health of the community to be maintained during periods of depression without interfering with the economic life of the community. Dr. EWART'S second thesis was that arguments applicable to the somatic cell were applicable to the reproductive cell. He adduced evidence that led him to think that the quality of the offspring of elderly parturients differed from that of children born to younger parents. In particular, he suggested that the susceptibility of the former group of children to fatal tuberculosis was greater than that of the latter group. But, since the decline of the birth-rate has been greater in the latter period of fertility than at younger ages, the proportion of persons born at the older ages of parents is diminishing. Hence, on Dr. EWART'S hypothesis, the proportion of susceptibles in the population is declining and the death-rate from tuberculosis should continue to fall.

Dr. EWART'S second thesis was frankly put forward as a suggestion; the statistical basis was slender and must be made far more substantial before much ætiological importance can be attached to the factor of parental age. But his first thesis raises an issue which, in various ways, is of pressing importance to all citizens. In many quarters the opinion is held that if people are only allowed to spend their own money in their own way, they will make better provision for their health and happiness than can be made for them by the best experts, necessarily spending money which would otherwise have been at the command of the private citizens. It is, of course, admitted by the intelligent users of this argument that people do not in fact spend the whole of their own money judiciously—obviously they waste a great deal on hygienic nostrums, the worthlessness of which has been demonstrated from generation to generation. But, it can be retorted, experts also waste a great deal of money; many measures to improve health, unanimously advocated by experts, have been found not to fulfil expectation. Psychologically it may be better to waste one's own money than to see it wasted by someone else, but we think, as one of the speakers in the discussion remarked, that there is a rateable proportion of evil in every reform, and that money will always be wasted in greater or less measure. It is the part of a statesman to strike a balance. The history of water-borne disease in this country is a sufficient proof that at least one great cause of sickness and mortality has been brought under control almost wholly by the labours of the public health service, central and local, not merely by virtue of their powers to execute laws, but still more by their action as teachers. It is surely the wildest exaggeration to assert that penury had a greater share than ignorance in the state of public water-supplies a generation ago. It is equally extravagant to argue that the conditions of impregnation, or even the maxims of her mother, are sufficient to convert a young married woman into a wise parent. Real wages increased a good deal between 1841 and 1900, but the rate of infant mortality in 1841–50 was precisely the same as in 1891–1900—153 per 1000 births. In 1901–10 it was 128; since the war it has not reached 100. We do not say that the whole of this reduction is due to public health measures, but those who affect to regard national and local health services as expensive luxuries should keep the facts in mind and furnish other explanations. Water-borne disease and infant mortality are instances which leap to the eyes. They at least are not explicable in terms of "real wages."

We shall hesitate long before we accept a simple economic ætiology of tuberculosis. There is a further point. A speaker in the discussion suggested that anybody wishing to attack a hygienic method always began by drawing a curve of something. We are ourselves moderately addicted to the habit of making charts, but we are convinced of the truth in WALTER BAGEHOT'S saying: "How much of real suffering is there that statistics can never tell! How much of obvious good is there that no memorandum to a Minister will ever mention!" In spite of the increase of "real wages," sufficient life stories of tuberculosis are known to all of us for it to need no great imaginative power to realise the vast sum of human misery which, without lengthening the life of a single victim, without diminishing by a unit the number of fresh cases, can be sensibly diminished and has been diminished by the methods now in operation.

## Lawson Tait and Listerism.

A SUFFICIENT number of years have now elapsed to enable us to estimate with some degree of certainty the position to assign to LAWSON TAIT in the evolution of abdominal surgery. It is true that before his time much had already been done by such men as MCDOWELL, CLAY, SPENCER WELLS, and THOMAS KEITH, yet we must remember that their experience was practically limited to dealing with ovarian cysts, and that it was TAIT'S work which rendered possible much of the enormous development in this branch of surgery which has since taken place. When we recall the part he played in perfecting the technique of the treatment of the stump in ovariotomy, in the operative treatment of pus tubes and

pelvic suppuration, in the development of the operation of oöphorectomy for the treatment of fibroids; that he was the first man to open the abdomen to arrest hæmorrhage in a case of ruptured ectopic gestation and the first to perform Cæsarean section for placenta prævia, we must admit that he was in every sense of the word a pioneer. In saying this we wish in no way to belittle the merit of the work done by SPENCER WELLS and others, but while it was inevitable that the advances made possible in general surgery by the adoption of LISTER'S principles were bound to extend to the abdominal cavity in the course of time, yet the claim put forward by Mr. W. J. STEWART MCKAY in his recently published "Life of Lawson Tait"[1] must be admitted. It was TAIT'S discovery that he was able to return an ovarian pedicle tied with a clean ligature into the peritoneal cavity, and abandon it with impunity, that led to his operating upon other abdominal organs with success, and that ultimately laid the sure foundations upon which the superstructure of abdominal surgery, as we know it at the present day, has been reared by the work of surgeons in all parts of the world. In 1868, when LAWSON TAIT performed his first ovariotomy, the average mortality of the operation was about 30 per cent., and in 408 cases operated upon by SPENCER WELLS during 20 years at the Samaritan Hospital there were 99 deaths, or a mortality rate of 24 per cent. In 1886 TAIT was able to publish a table containing a record of 137 consecutive ovariotomies without a death.

It is well known that LAWSON TAIT was a bitter opponent of Listerian principles right up to the time of his death, and the results just quoted were used as an argument against the necessity for the employment of Listerism in abdominal surgery. We can now, of course, realise that TAIT was in reality carrying out the best form of antiseptic surgery in that he was really practising aseptic surgery almost as it is practised at the present day, though he did not appreciate the true meaning of his scrupulous cleanliness. "He had learnt to be clean, LISTER had taught him what to avoid, but he refused to acknowledge that LISTER was his real teacher and master." TAIT soon came to the conclusion that so long as the ligature employed to secure the pedicle of an ovarian cyst was clean success was almost assured, and by the natural extension of this principle he was led to believe that other abdominal organs could be dealt with successfully in the same way. And he seems further to have realised that the peritoneal cavity was an area of the body which could be invaded with much greater safety than up to this time had been thought possible. It is interesting to recall the fact that when in 1881 he read his paper on his first 30 cases of oöphorectomy for the treatment of menorrhagia due to uterine fibroids, the authorities of the Royal Medical and Chirurgical Society did not consider it worth publishing. He performed this operation in all in 262 cases, with only four deaths, results which, when we consider the date at which they were achieved, are most astonishing; and although we now recognise that it is much better treatment to remove the tumour than to sacrifice the healthy ovaries, yet the experience he gained in performing these operations, and the results he obtained were important factors in enabling him to deal successfully with cases of pus tubes by operation—for he was certainly the first surgeon to show that this method of dealing with such cases was justifiable. Much of TAIT'S teaching in the light of our knowledge of to-day was erroneous, but he deserves great credit for his work in connexion with the recognition and correct treatment of cases of pelvic suppuration, teaching which was received with a great deal of unmerited scepticism and even abuse by his contemporaries. Moreover he was the first gynæcologist to recognise clearly the large part played by gonorrhœa in the ætiology of cases of pyosalpinx.

The present generation may need to be reminded that the ultimate development of abdominal surgery was due to the pioneer work of TAIT and of other gynæcologists in pelvic surgery. It was the success in dealing with such cases that led TAIT to attack other abdominal organs and to be the first surgeon in this country to perform the operation of cholecystotomy. In the same way, although he was not the first surgeon to operate upon hydatid cysts of the liver by the method of opening the cyst, sewing the edges of the sac to the abdominal incision, and introducing a drainage-tube, yet he was the first to establish this as a recognised surgical procedure among English surgeons by the publication of his cases in 1881. When we consider the views which TAIT held with regard to Listerian principles we must give him credit for the fact that at first he practised the method to the best of his ability. But in spite of care his results were very bad, and in his first 50 ovariotomies he had no less than 19 deaths. We must remember, however, that while he gave up most of the details which were included under the term Listerism as it was practised in those days, yet he in reality accepted and acted upon the main principle, and proclaimed his belief in "scrupulous attention to cleanliness of every kind and in all directions." If we review his technique we find that it differs but little from that adopted by many surgeons at the present time, and in this lay the secret of his great success. He cleansed the skin of the patient with soap and water, and in dirty cases with turpentine; he boiled his instruments and his ligatures; he surrounded his wounds with laundried towels; he took the greatest possible care in the preparation of his sponges; and, above all things, he took the most minute precautions to avoid infection of his hands, and was accustomed to allow some days to elapse after dealing with any septic case before performing an abdominal operation. Indeed, he was a striking example of that supercleanliness which we now know to be the secret of successful surgery, and, quite unknown to himself, was really one of the most advanced supporters of Listerism—an aseptic surgeon long before asepsis was generally practised or the meaning of the term was even understood.

[1] Lawson Tait: His Life and Work. Baillière, Tindall and Cox. 25s.

ELEVENTH INTERNATIONAL PHYSIOLOGICAL CONGRESS.—This Congress will be held in Edinburgh from July 23rd to 27th, 1923, Sir Edward Sharpey Schafer, F.R.S., presiding. Those who desire to be enrolled as members are requested to forward their names and addresses, together with the amount of their subscription (25s.) to Miss Charlton, Department of Physiology, University, Edinburgh, who will send on request particulars of hotels and lodgings, and all other necessary information.

SPECIAL ORTHOPÆDICS COURSE, CLINIQUE-CALOT, PARIS.—From Jan. 22nd to 28th, 1923, Dr. F. Calot will hold a special course in orthopædics at the Clinique-Calot. Instruction will be given in the treatment of congenital luxation of the hip, club-foot, infantile paralysis, and scoliosis; also in the treatment of surgical tuberculosis (coxalgia, Pott's disease, cold abscess, adenitis, epididymitis, &c.) and of fractures. The course is for French and foreign medical graduates and students. Instruction will be given in French, English, and Spanish. Fee for the course, 150 francs. Those wishing to attend should write to Dr. Fouchet, Institut-Calot, Berck-Plage, or to Dr. Collen, Clinique-Calot, 69, Quai d'Orsay, Paris. A detailed programme will be sent on application.

# Annotations.

"Ne quid nimis."

## MOTOR-CARS FOR MEDICAL MEN.

THE motor show being held at Olympia and the White City this week is in so far a departure that it is the first exhibition at which the motor trade has seriously attempted to meet the demands of the owner-driver of moderate means whose car is an important part of his business equipment. The average professional man needs only a body which gives adequate protection from rain and excessive cold, fitted to a chassis with a reliable engine consuming little petrol and requiring little attention. In a special article (p. 1034) we note several modest cars specially suitable for medical men and women, and would here call attention to an important innovation this year—the inclusion in the prices quoted for most of the better-class cars of the ordinary accessories, such as back windscreens, clocks, which were in former years regarded as extras. This inclusion enables a would-be purchaser to calculate his total liability at the outset. Otherwise, beyond a general progress in motor construction and a welcome decrease in the price of cars, there is no one feature that calls for special notice this year. Four-cylinder engines still predominate. Overhead valves are gaining ground, over 25 per cent. of the cars shown having incorporated them. The majority are still operated by a cam shaft underneath, and push rods and rockers. The overhead cam shaft, however, appears to be coming to the fore, and will doubtless be noted on more models next year. Among other engine points to be noted is the greater prevalence of aluminium pistons, and the wider use of a scraper ring. More cars have the unit system of construction for engine, clutch casing, and gear box, and it undoubtedly has many advantages. Magneto ignition still holds its own, but the modern battery and coil are so good and cheap that their use is likely to spread. The cone clutch continues in favour, and is preferred by many makers at any rate to the multiplate type if not to the single disc type. Electric lighting and starting are now practically standard and included in the usual accessories provided. Central control has not yet ousted the side variety, though it has strong claims. Many models show both brakes acting on the rear wheel drums. As to springs, there seems to be little uniformity as to the best mode of suspension. Most of the cars shown have half elliptic springs in front, while at the rear more are fitted with this type of spring than with cantilever or quarter elliptics. The majority of cars now built are well sprung and well made.

This being freely and gratefully acknowledged, attention may be called to further improvements in detail which would be of particular value to the medical owner-driver without increasing his outlay to any considerable extent. Many doctors do not find time to give their cars that minimum attention which is essential to continuous smooth running, with the result that small repairs and adjustments are sometimes necessary on the road. These could be effected at much less inconvenience were the tools more easily accessible, for example, in one of the doors. Many small devices in common use in America might be adopted, such as an indicator-gauge on the petrol tank; a connexion in series between the tail lamp and one on the dash-board, so that the driver may know for certain that his tail lamp is alight; larger pockets for maps, papers, or instruments; some sort of cupboard or shelf for a professional bag; and provision for locking the switch, which, even if imperfect, makes theft more difficult. Those with mechanical minds may scoff at these devices as being about as important as the colour of the paint, but not all medical men have mechanical minds, and any effort on the part of motor manufacturers to meet our difficulties would surely be rewarded.

## PHYSICAL METHODS IN CARDIAC DIAGNOSIS.

How far behind other workers on the continent, and particularly in France, the British School is in the application of physical methods to the diagnosis of cardiac lesions was the question put by Dr. Robert Knox at the opening meeting of the Section of Electrotherapeutics of the Royal Society of Medicine. Dr. Knox, the new president of the section, gave an illuminating address on this subject. He reviewed the history of cardiology from the grand discovery of Harvey, and the work of Auenbrugger on percussion, to that of Laennec, the inventor of the stethoscope, and other brilliant workers of the eighteenth century. The important part that physics has played in later years in the development of methods of diagnosis was instanced by the string-galvanometer of Einthoven and the electro-cardiograph as instruments of precision, and with the advent of X rays another and important link in the physical side of examination of the heart and blood-vessels was forged. The invention of the technical apparatus was followed in rapid succession by fluoroscopy, radiographic records, orthodiagraphy, telerontgenography, instantaneous radiography, and the slit diaphragm records with the moving plate of Gottch and Rosenthal, all of which have been and are still used as purely physical methods of examination. Perhaps the most important work of recent years has been that of Forssell of Stockholm, and the work of Vaquez and Bordet, of Paris. The former, working with powerful apparatus at a distance from anticathode to plate of 2½ metres, has eliminated the distortion of the heart, and his skiagrams show the cardiac shadow to be in effect an actual drawing of that organ. Drs. Vaquez and Bordet, working at the hospital of St. Antoine, lay great stress upon the necessity of using precise radiological methods, and the combination of teleradioscopy and orthodiagraphy is held by them to give more important information than that of the radiographic plate taken at a distance. The work of these two writers has been advanced by that of Woodburn Morison and L. M. White, who have designed apparatus for investigation in suspected cases of cardiac hypertrophy by accurate measurement of the heart, that is to say, the depth of the left ventricle in the mediastinum. Their work is based on the triangulation method used for localisation of foreign bodies, having regard to the fact that in the work in question there are certain features which make it more complicated. If the apex of the heart were a point, the depth could easily be calculated by the method referred to, but this is not the case. The method adopted is as follows: the patient is placed in position behind the screen, which is fixed at a distance of 60 cm. from the anticathode, and he is instructed to place his chin upon the top of the screen. With the diaphragm opened to its fullest, a preliminary examination is made in order to place the patient in such a position that there is ample working distance for a 10 cm. shift of the tube. The diaphragm is then shut down to a narrow slit so that the extreme apex of the heart lies in the centre of the beam of light. A mark is then made with a grease pencil on the screen over the apex of the heart. The tube is shifted 10 cm. to the left, the diaphragm opened wide, and a second mark made corresponding to the fresh edge of the shadow of the apex. The distance between the two is read on a millimetre scale. This figure has been described by Drs. Vaquez and Bordet as "the index of the development of the heart in depth." A comparison with the normal index figure—i.e., an average of 10 mm. for normal hearts—shows a large range up to about 40-42 mm. in hypertrophied hearts. To facilitate the procedure simple apparatus has been designed which does away with the necessity for using a grease pencil, can be fitted to any existing stand, and renders the operation somewhat more accurate. Metal wires are fixed in a framework 10 cm. apart, and the tubeshift is arranged so that these wires occupy the position of the grease pencil, thus making a simple and more

rapid calculation upon a third wire and a millimetre scale. Although for the time being, at least, the electro-cardiograph holds the field in diagnosis of functional abnormalities of the heart, Dr. Knox made it clear that other apparatus is capable of giving much valuable information regarding the size of the heart, the degree of hypertrophy existing, and a record of the movements of the edge of the organ.

## RAT-BITE SPIROCHÆTOSIS.

THE past week has witnessed two anniversaries of nefarious characters with subterranean activities. Guido Fawkes survives only in harmless effigy, but the rat is a grave economic danger and a menace to the public health, the extent of which is only coming to be recognised. We report elsewhere the conferences on Nov. 6th at Holborn Council Chamber and St. Pancras Town Hall, when sanitarians, clinicians, and administrators took counsel together regarding practical measures for fighting the rat. Apart from its share in transmitting plague, considerable interest attaches to the rôle of the rat as a carrier of spirochætal disease. Spirochætal jaundice occurred in the rat-infested trenches of Flanders during the war, and there is some reason for thinking that certain outbreaks of apparently infective jaundice, such as have occurred in schools, may have been spirochætal in origin and that inquiry might result in tracing the source of infection to rats. The occurrence of a spirochætal fever following rat-bite has been much studied in Japan and the United States. At the Royal Society of Tropical Medicine and Hygiene on Oct. 19th, Dr. R. Row, of Bombay, dealt with rat-bite fever in India—modern text-books also quote its rare occurrence in England and elsewhere—where, on Dr. Row's showing, the disease is common. There is sound reason for belief that rat-bite fever has been known in India for many centuries. So far back as A.D. 300 Sanskrit writings, which he quoted, contained descriptions very closely resembling the main features of the disease as it occurs at the present day, in particular its febrile character and course, and the secondary cutaneous lesions. Dr. Row attributed its prevalence in India to the peculiar quasi-humanitarian objection or superstition of the native to the destruction of animal life, which fostered the survival of rodent pests and so was indirectly responsible for the persistence of such diseases as rat-bite spirochætosis and, notably, plague. The primary lesion resulting from the infected rat's bite usually exhibited considerable inflammatory swelling owing to the presence of pyogenic organisms in addition to spirochætal infection, and was frequently much aggravated by the native custom of applying a dressing composed of rats' fæces. In the subsequent course of a case of rat-bite fever an interval of some weeks usually elapses after the acute inflammation has subsided and even after the primary wound has healed. The scar then becomes tender, swollen, and ulcerated to form a small raised circular ulcer surrounded by a painful zone of hyperæmia. The patient is acutely ill, with temperature raised from 101°, 102°, to 104° F., headache, and marked prostration. The secondary cutaneous manifestations develop in the form of painful urticarial patches, or reddened, occasionally purpuric, papular eruption, at first restricted to the affected limb, but later becoming more general. In one case, which Dr. Row illustrated by lantern-slides, the papules were distributed over the hands and face. The temperature chart, exhibited on the screen, showed the characteristic acute febrile onset followed after some days by an afebrile interval and subsequent periodic rises and falls, much resembling the course of relapsing fever and yielding to treatment with novarsenobillon. Dr. Row described and showed under the microscope, as well as by microphotographs on the screen, the minute spirochætes which he had discovered in the cases of rat-bite fever in India. He compared them with the larger forms of spirochæte which had been identified in 1916 by Futaki, Takaki, and other observers in similar cases occurring in Japan. He had obtained the parasite in the blood-stained serous fluid expressed from the ulcerated scar of the original rat-bite, and had succeeded in transmitting it by inoculation both into the monkey and into the guinea-pig. Although he failed to find the spirochætes in the circulation of the original patients, he was successful in recovering them from the blood of the inoculated animals. The variety of spirochæte he had so found was less than half the size of those described by workers in Japan, being only about 1–2 $\mu$ in length and possessing seldom more than two spirals when seen separately, but it was common to find two spirochætes in close approximation end to end, giving the appearance of several continuous spirals. It differed from the parasite *Leptospira morsus muris* recorded by Japanese observers and the *Leptospira icterohæmorrhagiæ* of infectious jaundice, not only in its small size but also in the absence of tapering extremities and terminal flagella, and he proposed to call it *Spirochæta "pettit,"* after the distinguished worker of that name. He drew attention to the erroneous conclusions arrived at by American investigators, who had described varieties of pyogenic organisms, streptococci and the like, as the primary infective agents in rat-bite fever, whereas they played but a secondary part in the disease, though responsible for aggravation of the inflammation of the initial wound. At an earlier date (1914) Schottmüller had also reported the discovery of a streptothrix, corroborated by Blake, in cases of rat-bite fever, which similarly could no longer be regarded as the genuine infective cause of the disease. Dr. Arthur Powell, in the subsequent discussion, fully corroborated Dr. Row's observations and estimated the prevalence of rat-bite fever among the Bombay police force from his own experience at about one per mille.

## THE DIARY OF A SHIP'S SURGEON.

IN the Atlantic express steamers of to-day man, having called steel and fire to his aid, defies Nature to thwart his purpose of crossing the great ocean in five days. In the diary[1] of Dr. Charles Edward Smith, surgeon of the Hull whaler *Diana* in 1866–67, a story is told of the time, only 50 years ago, when with wood and sails man had to woo Nature as a suitor. Dr. C. E. Smith joined the *Diana*, of 355 tons and 30 h.p., at Hull and went to sea on Feb. 19th, noting that every pier, wharf, and ship by the riverside was covered with well-wishers who cheered lustily, recognising the perilous nature of the voyage, and the risk attending whale-fishing. The officers and 20 sailors came from Hull, 26 more were embarked at Lerwick. They first sailed to Jan Mayen Island, north-east of Iceland, for seals, and made a second departure from Lerwick on May 8th for Davis Straits and Baffin's Bay in pursuit of whales. This "country," as the whalers called it, is practically full of ice. The east winds of early summer blow the ice to the west, leaving a lane of water along the Greenland coast. Through this lane the whaling fleet (18 ships) felt its way past Disco Island and then across to the Canadian side. *Diana* got two whales on June 30th and all was hope, but the wind changed to the east, the ice crowded to the west side, so there was no open water for the whales. Anxiety about the return home became acute, and the *Diana*, after feverish voyages hither and thither in search of a water lane, recognised in September that she could not get home and that her two months' provisions must be made to last for six. The men had little clothing and the ship all too little fuel. They pushed into the ice in the hope that its southerly drift would free them the sooner; but the risk was terrible. The ice was always drifting south in mass, but in detail it constantly opened and closed and filled itself up as winds and currents decided. Many were the anxious days and nights when great icebergs, forcing their way through the pack, or ice movements due to gales of wind, threatened to crush the ship. Twice she was

[1] From the Deep of the Sea. London: A. and C. Black. 1922. Pp. 288. 10*s*. 6*d*.

abandoned, but each time the crew were able to return to her. She sprung a leak and the men, already exhausted (their ration, on a rough estimate, works out at 1760 calories), had this new and persistent labour of pumping forced upon them. The cold was intense; medicines froze in the bottles under the patients' pillows. Spars and even boats were cut up for fuel. Soot from the oil lamps was everywhere, "Everyone is covered with soot, breathes soot, and is begrimed and smothered with soot." Their perspiration froze into a layer of ice within their boots, and their breath froze on the walls of their rooms. Thirty-five bucketsful of ice were one day scraped off the mess-deck. Scurvy broke out in January, 1867, and gradually increased, disabling the crew; 12 men died of it and it was recognised by all that it was only Dr. Smith's energy and persuasiveness that brought so many men safe home. Indefatigable in treating the sick, he insisted that no man should give in; he forced the men to exercise themselves, and encouraged them by showing an example of energy, for, in addition to his medical work, he took his turn at the pumps and in the watch on deck. At length, on March 17th, being then off Labrador, the vessel escaped from the ice, made her way to Lerwick, and thence to Hull, where, on April 26th, she was again greeted by crowds. Dr. Smith was not without recognition for his work. The doctors of Hull gave him a dinner and a silver inkstand, the Board of Trade presented him with a large case of surgical instruments, and from the people of Hull and the underwriters he received 100 guineas and a testimonial. The book is a fascinating record of hardships and tenacity for which we are obliged to the editor, Dr. Smith's son, Dr. C. E. Smith Harris, a medical officer in the Cunard Company. The illustrations are Dr. Smith's. One, very impressive, shows the tiny ships making their way through the vast icefield, and the tail-piece of Chapter XVII. gives a sketch of "Greenland's icy mountains."

## ACHYLIA GASTRICA.

IT was pointed out by Dr. Joseph Sailer in a paper read before the Section of Gastro-Enterology and Proctology at the St. Louis meeting of the American Medical Association,[1] that the condition known as achylia gastrica was described first by Samuel Fenwick in a clinical lecture[2] at the London Hospital. Dr. Sailer is of the opinion that the best definition of achylia gastrica is that it is a persistent failure of free hydrochloric acid in the gastric contents and the absence of gastric ferments, but he has been unable to determine the amount of the hydrochloric acid deficit. However, he has convinced himself that when such deficit is considerable the ferments are invariably absent. Thus this deficit is apparently of some value in making a diagnosis. Achylia gastrica is a frequent complication of other diseases, pernicious anæmia and carcinoma, for instance. Einhorn[3] made the important clinical distinction between such forms of the condition and those in which the defect in the gastric secretion seems to be the main lesion. He emphasised the point that many of the causes were associated with that disordered state of the nervous system then known as neurasthenia. From his own experience Dr. Sailer deduces that the gastric secretion is a function of the body which can be dispensed with, that the condition is largely functional, and that dietetic measures are ineffective. Dr. Frank Smithies (Chicago), who took part in the discussion, said he had not noticed, except as a temporary influence, that any psychic state bore much relationship to the permanency of achylia, but he had been particularly impressed by its association with biliary tract affections. Twenty per cent. of gall-bladder cases which had come under his notice showed achylia, the patients for the most part being over 40. Dr. H. W. Soper (St. Louis) held that as the progress of a case of achylia gastrica is largely dependent upon the integrity of the whole digestive tract, dietetic measures are of importance in protecting the small intestine. Dr. Carlson (Chicago) held the view that some cases at least had an organic origin—namely, atrophy of the gastric mucosa. In this country entire absence of gastric secretion is regarded as an extremely rare phenomenon among healthy individuals, and the term achylia gastrica, along with the terms hyperchlorhydria and hypochlorhydria, is reserved for pathological conditions. The absence of gastric hydrochloric acid in itself is not very serious. It is useful for protein digestion, for controlling the action of the gastric sphincters, and is an important but not essential means of diminishing bacterial growth in the intestines. Appreciation of these facts explains the mildness and frequent absence of symptoms in such cases. But the question is still open whether achylia may not be of vital importance in the pathogeny of such diseases as pernicious anæmia and cirrhosis of the liver.

[1] Published in the Journal of the American Medical Association, Oct. 7th, 1922.
[2] THE LANCET, 1877, ii., 1, 39.
[3] Medical Record, June 11th, 1892.

## A DISCREDITED SIGN OF CONGENITAL SYPHILIS.

IN 1917 R. Sabouraud[1] described what he regarded as a new sign of congenital syphilis—namely, an accessory cusp on the upper first permanent molar tooth. This extra cusp may be a small rounded eminence, or it may be a prominent tubercle separated from the antero-internal cusp by a fissure; it is situated on the lingual aspect of the large antero-internal cusp. Sabouraud was emphatic as to the value of this sign and states, that

"in the majority of cases it (the accessory cusp) might exist alone, no other stigmata of congenital syphilis being present in the same subject. In more than twenty consecutive cases without a failure a positive serum reaction (Wassermann) has shown its clinical value..... This malformation, which is frequent and which often exists alone in a mouth with a dentition otherwise regular and normal, can represent by itself alone a certain sign of congenital syphilis."

The statement lacks nothing in positiveness, and coming from such a well-known authority on syphilis has aroused considerable attention in France, although but little has been heard of it in this country. At first it was debated from the standpoint of the syphilologist. Martoux[2] found the cusp present in seven soldiers, none of whom showed any sign of congenital syphilis; two of them had a positive W.R., but this was due to an acquired syphilis. He also quotes Mozer and Chenet,[3] who found the cusp present in 19 children, none of whom showed any signs of congenital syphilis and all had negative W.R. The dentist then began to take a hand and soon placed the "sign" in a different aspect. It was shown that this cusp had long been known under the name of the tubercle of Carabelli. On the continent quite a considerable literature has gathered round the anatomical significance of the cusp, though in this country it has passed almost unnoticed. L. Bolk has found the cusp present in some degree of development in over 40 per cent. of cases; it is often present on the second upper deciduous molar and may occasionally be found on the second upper permanent molar. W. K. Gregory[4] states that it has been found in Neanderthal man and is occasionally present in the anthropoid apes. Jeanselme[5] says that it is frequently present in ancient Egyptian skulls; he found it as common in Parisian cemeteries before the fifteenth century, when syphilis became common, as after it. E. C. Sprawson[6] in a recent paper states that he has found the accessory cusp to be a very common abnormality. He began to investigate its frequency with a view to checking Sabouraud's statement and intended to have a Wassermann test performed on all children showing the accessory cusp. The statistical results were so conclusive as to render

[1] La Presse Médicale, March 22nd, 1917.
[2] British Journal of Children's Diseases, April, 1918.
[3] La Presse Médicale, Sept. 20th, 1917.
[4] W. K. Gregory: Origin and Evolution of Human Dentition, p. 454.
[5] Bulletin de l'Académie de Médicine, 1917.
[6] Proc. Roy. Soc. Med., Odont. Sect., vol. xv., No. 11.

this unnecessary. Out of 100 children only 35 had the cusp absent; in 39 it was slightly marked and in 26 well marked. Other observers also give figures which lie between this percentage and the lower figure given by Bolk. It is obvious that this high percentage negatives Sabouraud's theory. It may be confidently stated that this accessory cusp, while of considerable anatomical interest, has no pathological significance.

## TUBERCULOSIS OF THE HEART.

IN a review of recent work on tuberculosis in the November issue of *Medical Science*, by Dr. J. D. Rolleston and Dr. C. Lillingston, several papers are summarised which deal with tuberculosis of the heart. According to Benvenuti, tuberculosis of the myocardium was first described by Laennec in 1826, since when numerous cases have been published, so that Raviart in 1906 was able to collect 185 examples of this rare condition from the literature. In almost every case tuberculous disease of the heart is secondary to involvement of the mediastinal glands. As a rule, as in the case reported by Benvenuti, it develops in an insidious and latent manner, so that Dieulafoy regarded it merely as an autopsy finding without any clinical history. Benvenuti, however, makes the interesting suggestion that the functional cardiac disturbance which is so marked a feature in the last stage of pulmonary tuberculosis, as happened in his recorded case, is sometimes due to a secondary localisation of disease in the myocardium. Maresch is quoted as saying that though tuberculous pericarditis and small nodules in the myocardium and endocardium are frequent in generalised miliary tuberculosis, extensive tuberculosis of the heart wall is rare, especially in adults. Of 36 cases of conglomerate tubercles of the myocardium collected by Stephani from the literature, more than a quarter were in children under 10, and almost half in persons under 20. Special interest, therefore, attaches to two cases of tuberculosis of the myocardium reported by Maresch in adults, aged 58 and 33 respectively, which were the only examples of the condition among 16,000 autopsies. In the first case the myocardium of the right auricle contained a caseous nodule the size of a hen's egg, and in the second case there was a diffuse infiltration of the left ventricle with slight involvement of the right ventricle. Weiss, of Philadelphia, also testifies to the rarity of tuberculosis of the heart muscle by stating that Norris among 7219 autopsies found 1780 cases of tuberculosis, among which were 82 examples of tuberculous pericarditis, in 5 of which the heart muscle was involved. Weiss himself also reports two cases in adults, both men aged 25, in whom the necropsy revealed enormous fibro-caseous tuberculous involvement of the thoracic lymph-nodes with extension to the pericardium, and in one case to the heart muscle, causing considerable enlargement of the organ. A unique case has recently been reported by Korybut-Daskiewicz, of Warsaw, in an infant aged 1 year and 8 months, whose mother had died of pulmonary tuberculosis. There were no signs of severe cardiac disease during life, but the autopsy showed in addition to diffuse bronchitis and an infarct in the left lung, tuberculous endo-, peri-, and myo-carditis and a ruptured aneurysm of the base of the heart which was the cause of sudden death.

## THE PATENCY OF THE FALLOPIAN TUBES.

THERE was a phase in the treatment of sterility when every childless woman who sought advice was dilated and curetted. The assumption was that "sterility in women" was synonymous with "sterility of women." In the last generation women have been spared a certain amount of unnecessary operation by promulgation and wider recognition of the fact that in an appreciable proportion of cases sterility in women is due to sterility of man. It is now accepted doctrine that, unless the condition of a childless woman's organs is quite definitely faulty, no operative treatment should be undertaken until it has been ascertained that the husband is not at fault. This is a good and useful step forward. But another fallacy has long been allowed to go unrecognised. The husband may be proved to be normal; the wife appears to be so; but no pregnancy results. On the chance that the uterus may be at fault it is dilated and curetted: still nothing happens. The explanation is often that the Fallopian tubes are not patent, the obstruction being either at the fimbriated opening or at the uterine end of the tube. Lately, investigators have taken up the very reasonable position of urging that the patency of the tubes should be tested before other procedures are tried, and especially before a curetting is done on the off-chance that it may do good. Methods have been devised whereby this patency is tested by means of air or gas introduced into the uterine cavity. Graff,[1] of Vienna, has recently described an apparatus which is a modification of that of Rubin of New York. Sterilised air or gas is driven into a form of bell-jar through one of three openings. The second opening is connected with a mercurial manometer, and the third with a tube at the end of which is a cannula for insertion into the uterus. The force that urges the gas into the uterus is thus the pressure of mercury; and if the tubes are patent, gas passes through into the peritoneal cavity and the mercury falls. There are, of course, certain contra-indications to the use of this method; for example, the presence of acute or chronic inflammatory processes, uterine hæmorrhage, the possibility of uterine carcinoma, or extra-uterine pregnancy. Graff gives the almost unnecessary warning that this test of sterility must not be used when the possibility of intra-uterine pregnancy is suspected. It is recommended also that it be not employed in the days immediately preceding and following menstruation. In the Vienna clinic 60 cases of sterility were examined and in more than one half of this number the tubes were found to be not patent. In five cases this was confirmed by a subsequent laparotomy. It would thus appear that occlusion of the tubes is a much more frequent cause of sterility than is usually suspected.

[1] Wiener Klinische Wochenschrift, Wien, August 31st, 1922.

## THE "BUFFER" YEAR IN THE MEDICAL CURRICULUM.

THE resignation of Prof. J. B. Leathes, F.R.S., after six years' service as Dean of the Faculty of Medicine of Sheffield University, calls for some appreciation of the evolution of the medical school under his guidance. During his long term of office Prof. Leathes had to cope with a great increase of work due to the influx of students at the close of the war, and, as in other places, the pressure entailed upon existing accommodation and staff has made the labours of his office more onerous than ever before. To say that he has overcome those difficulties is but a meagre tribute to the vast amount of valuable work he has organised. Thanks to his initiative and determination, important innovations have been made in the medical curriculum. The whole system of clinical instruction has been remodelled, and a definite attempt has been made to bring into closer coöperation anatomical and physiological studies with the clinical work. This has been brought about by making the middle or third year of the curriculum into a kind of "buffer" year, in which the student spends part of his time in elementary clinical studies at the hospitals and the remainder in the anatomical and physiological laboratories. During this year his clinical studies are all under immediate supervision and instruction, and he does not enter upon the duties of dresser or clerk until this intermediate year is completed. The main object aimed at in this rearrangement of clinical instruction is to prevent the irrecoverable loss of time that is apt to occur when students start work at a hospital without any knowledge of what to observe or any prescribed plan of the order in which they should gain their experience. Now, after a year of systematised instruction in the elements of medicine and surgery, they are found more fit to be entrusted with the duties

of clinical clerks and dressers, and greater opportunity is thus afforded them for independent observation; they learn more in the three months that they have for each of these appointments than they have formerly attained to when these appointments could be taken earlier but lasted for six months. It is as yet early to form a definite opinion as to the value of this innovation, but it appears to be stimulating interest in both clinical and laboratory studies. Such difficulties as have arisen are of minor importance and can be adjusted. Teachers of medicine and surgery cannot expect from the "buffer" year student the same level of anatomical and physiological knowledge assumed of the junior in the wards who has passed his intermediate examination, though it must be admitted that even those most recently promoted from the school to the hospital seldom supply a correct answer promptly to a simple anatomical or physiological question flung at them over a patient's bed, however accurately they could answer it on a "subject." It is just this lock-up system of disposing of the subjects of the curriculum that the "buffer" year is designed to break down. We anticipate that Prof. J. S. C. Douglas, who succeeds Prof. Leathes as dean, will attempt to secure a corresponding dovetailing between pathological and clinical teaching throughout the clinical course.

## THE SINISTER SIGNIFICANCE OF PREMATURE MENSTRUATION.

As an appendix to the article on the menstrual cycle by Dr. Winifred Cullis and her co-workers in THE LANCET of Nov. 4th, reference may be made to a paper by Dr. A. Scherer[1] in which he deals with the significance of early or premature menstruation. For several years he has been inquiring of his women patients, suffering from pulmonary tuberculosis, the age at which the onset of menstruation (menarche) occurred. His material consists of 10,216 cases of definite pulmonary tuberculosis in women who could state with certainty their age at the menarche. The average age was 15·6 years, whereas the average age for all women in Munich, Petrograd, Berlin, and Königsberg has been found to be 16 years. Thus there was a difference of about five months. Instructive light was thrown on this difference when the 10,216 cases were classified according as they belonged to the first, second, and third stages (Turban-Gerhardt) of pulmonary tuberculosis. The average ages at the menarche for these three stages were 16·05, 15, and 14·7 years respectively. Considering that the numbers in each stage were great, it is evident that these differences could not be fortuitous, but must depend on some factor of fundamental importance. Classifying his material according as he considered the prognosis favourable, doubtful, or unfavourable, Dr. Scherer found that in the first class only 2·95 per cent. had begun to menstruate before the completion of the fourteenth year. But this was the case in 31·4 per cent. of the patients with a doubtful prognosis, and in as high a proportion as 63·9 per cent. of the patients with an unfavourable prognosis. These figures speak for themselves, and Dr. Scherer asks: Does an early menarche favour the subsequent outbreak of tuberculosis, or does already existing tuberculosis hasten the menarche? He is inclined to answer the latter question in the affirmative, and compares the premature menarche in the woman with the premature development of weakly plants and animals doomed to early extinction and fulfilling Nature's insistent demand for reproduction. Dr. Scherer has also studied in a group by themselves the 1144 patients whose menstruation began abnormally late—i.e., after the completion of the eighteenth year. In the overwhelming majority the disease was of a benign and more or less stationary character, and even among the 57 patients in the third stage of the disease these characteristics were usually maintained. The lesson of these investigations would seem to be that the girl, whose menstruation begins abnormally early, requires closer medical supervision and care for many years to come than the girl whose menstruation begins at the usual age or later. It would be interesting if the relation of menstruation to other diseases were studied on the same lines as those followed by Dr. Scherer, for it is conceivable that departures from the normal may give a clue to successful prophylaxis in diseases other than tuberculosis.

[1] Beiträge zur Klinik der Tuberkulose, Bd. xlix., Hft. 1.

## DESICCATED HUMAN HEADS.

THE ghastly curios described by Sir John Bland-Sutton in the front of this issue of THE LANCET have always fascinated the traveller in South America, although for obvious reasons their exportation is discouraged. The most remarkable feature of these artificially contracted human heads is the hair which is firmly attached and is generally glossy and abundant. The large amount of contraction is shown by the abnormal thickness of growth, and also by the deep furrows on the cheeks. The shape of the ears is specially well preserved. A typical specimen was shown at a meeting of St. Mary's Hospital Medical Society and depicted in the hospital *Gazette* of March, 1917, where one of the ceremonies observed in connexion with the heads was noted. The head of an enemy having been acquired and preserved, it is fixed on the spear of the conqueror at a public feast and is abused by him in violent terms. The Indian priest replies on behalf of the head with equal heat, and the victor then strikes and wounds the face, after which insult he sews up the mouth rapidly in order to make sure of having the last word. The head is thenceforward condemned to perpetual silence, except when consulted as an oracle. Sir John Bland-Sutton's investigations confirm the occurrence of this ritual. Other ceremonies of a similar type were described by Dr. H. M. Page in the *Journal of Anatomy and Physiology* (1897); he adds a table of cephalic and other measurements of his specimen, compared with those of a normal skull, in the attempt to estimate the amount of shrinkage and to throw light on the racial type.

THE next session of the General Medical Council will commence at 2 P.M. on Tuesday, Nov. 28th, when Sir Donald MacAlister will take the chair and give an address. The Council will continue to sit from day to day until the termination of its business.

THE new X ray department of the Manchester Royal Infirmary will be formally opened by Sir Humphry Rolleston next Saturday, Nov. 18th, at 2.30 P.M., during the joint provincial meeting of the Rontgen Society and the Electro-therapeutics Section of the Royal Society of Medicine, to be held in Manchester on Nov. 17th and 18th. At 5.15 P.M. on Friday in the clinical theatre of the Infirmary, Prof. Jacobæus of Stockholm is to demonstrate the cauterisation of pleural adhesions under fluoroscopic control, and he will be entertained to dinner the same evening. Saturday morning will be occupied by visits to the Radium Institute, the X ray department of the Skin Hospital, and a number of important engineering works. The meeting and dinner are open to non-members, who should apply for invitation to Dr. A. E. Barclay at the Royal Infirmary, Manchester.

HUNTERIAN SOCIETY.—A well-attended meeting of this society was held on Oct. 16th at Simpson's Restaurant, Cheapside, London. After dinner Dr. R. Fortescue Fox, the President, gave an address on the Breakdowns of Middle Life. Dr. Ernest Young read a paper on the Treatment of Dyspepsia in Necessitous Patients. The following took part in the discussion: The President, Sir Bruce Bruce-Porter, Dr. H. H. Sanguinetti, Dr. E. Young, Dr. D. Ross, Dr. E. Ash, Dr. J. Burnford, Dr. Langdon Brown, and Mr. Mortimer Woolf. The next meeting of the society will be held at the Cutlers' Hall, Warwick-lane, E.C., on Nov. 20th, when Dr. Porter Phillips will open a discussion on the Position of Insanity in Criminal Law.

# PRECAUTIONS AGAINST THE SPREAD OF SMALL-POX.

OFFICIAL advice and support in connexion with epidemics of more or less benign infectious diseases may be welcome enough, but even the threat of a possible spread of small-pox causes sufficient uneasiness in informed circles to make Government memoranda and recommendations weighty documents. If these are followed in the spirit as well as the letter responsibility, if not shifted, is anyhow shared with the highest authority for the maintenance of the public health, and, moreover, the coördination of precautions in different areas is assured. Two memoranda have just been issued by the Ministry of Health addressed to boards of guardians and sanitary officers respectively, outlining the steps to be taken on the occurrence of small-pox in any area.

*Steps to be taken by Boards of Guardians.*

In the first of these memoranda boards of guardians are reminded that under the terms of the Public Health (Small-pox Prevention) Regulations, 1917, the medical officer of health or any assistant medical officer of health is authorised to vaccinate or re-vaccinate persons who have been in contact with small-pox and are willing to be vaccinated. The primary responsibility for vaccination and re-vaccination at the public expense remains, however, with the board of guardians, who, if any case of small-pox occurs in their respective unions or parishes, should see that measures are promptly taken to secure the vaccination or re-vaccination of such persons as are specially exposed to the danger of infection. Should local circumstances appear to demand the exercise of the power conferred on the Minister of Health by Section 7 of the Vaccination Act, 1898, to require any board of guardians to provide vaccination stations and to modify, for a certain area, the provisions of that Act requiring the public vaccinator to visit the home of a child, application should be made to the Minister. It is also provided that district medical officers in attendance upon any person suffering from small-pox shall be entitled to payment from the guardians for vaccinating or re-vaccinating any person who is resident in the same house as the sick person. It is considered that these provisions, promptly applied, will in general be found adequate to stop the spread of the disease.

*Special Instructions to Vaccination Officers.*—These include suggestions that the medical officer of health, the district medical officers, and the registrars of births and deaths should give immediate information to the vaccination officer of any cases that come under their official notice. Private medical practitioners may be invited to give similar information, and the coöperation of persons who visit among the poor should be secured. In a locality in which the infection exists, in order to ascertain what children are unprotected by vaccination, house-to-house or even room-to-room visiting may be required. Special advice is given with regard to the prompt vaccination of children between the ages of 6 months and 14 years; in infected localities parents should be advised not to wait till the child reaches 6 months. The public vaccinator is also at liberty to re-vaccinate all persons over 10 years old who have not been re-vaccinated within a period of ten years. Generally, the vaccination officer should take all possible measures to ensure that the vaccination of his whole district is as complete as possible.

*Special Instructions to Public Vaccinators.*—On the receipt of a notification of small-pox the public vaccinator should offer vaccination or re-vaccination to the inmates of the invaded house unless this offer has been already made. He should proceed promptly to all cases referred to him, and should inform the medical officer of health of any suspicious cases he may meet with. In ordinary circumstances no infant should be vaccinated under the age of 2 months, but younger infants should be vaccinated if a case of small-pox is actually present in the household or if the infant has been exposed to infection. A child under the age of 12 months must be vaccinated at its home, older children may be vaccinated at such other place as may be arranged. Persons having the custody of a child who neglect to cause it to be inspected after vaccination are liable to prosecution. Persons who have been re-vaccinated without charge and fail to attend for inspection, or to permit the public vaccinator or his deputy to ascertain the result of the operation, are liable to pay the re-vaccination fee. Vaccine lymph from the Government establishment can be obtained by public vaccinators on application to the Government Lymph Establishment, Colindale-avenue, The Hyde, London, N.W. 9. Telegraphic address: "Defender, Hyde, London." Telephone number: Kingsbury 41, London District.

*Steps to be taken by Sanitary Authorities.*

Medical officers of health are asked to examine the weekly statistical returns prepared in the office of the Registrar-General, in order that the liability of any district to its introduction may be recognised early. Relevant information should immediately be given to the M.O.H. personally or by telephone by practitioners. The steps to be taken by the M.O.H. on the notification of a case of small-pox are outlined. These include the visiting of the patient with the practitioner, the removal of the patient to the hospital if the diagnosis is verified, the reporting of the case to the Ministry of Health, and the vaccination or re-vaccination of the contacts and daily medical observation of these for a period of 16 days. It is seldom necessary or desirable during this period to confine them to their homes. The vaccination of the small-pox hospital staff, the disinfection of houses and clothing, the need for careful inquiry into the movements of patients during the three weeks preceding the onset of the disease are among the points to which attention is drawn, also the duty of the M.O.H. to give information of the presence of the disease in the district to the public vaccinators, vaccination officers, clerk to the board of guardians, and the local practitioners. Compulsory notification of chicken-pox is advised if any extensive outbreak of small-pox appears probable. Notification of small-pox cases to medical officers of health of adjoining areas is advised, and the preparation of a complete list of contacts of each case is essential.

*Isolation of the Sick.*—Satisfactory provision for small-pox patients can rarely be improvised. Arrangements should be made to secure that hospital accommodation for isolating first cases is available for immediate occupation, and that more extended hospital accommodation is available at short notice.

In providing a small-pox hospital, it should be borne in mind that (i.) the hospital should be as remote from inhabited districts as is practicable; (ii.) the treatment of small-pox should not be undertaken in any hospital, or on the same site as any hospital, used for the isolation of any other disease; (iii.) the hospital site should be adequately fenced, to prevent unauthorised communication between the occupants of the hospital and persons outside; (iv.) an ambulance should be available for the removal of patients.

Every person suffering from small-pox should be removed to the small-pox hospital. Such removal may be ordered by a justice if required, and the necessary detention of patients is also legally provided for.

Public notice should be given of the penalties to which persons are liable on account of the exposure of small-pox patients, the use without proper precautions of public carriages for the conveyance of persons suffering from small-pox or of the bodies of those who have died therefrom, the letting of infected houses or rooms, the sale or sending about of infected articles, or the throwing into ashpits of infectious rubbish; and proceedings should be taken by the sanitary authority in every case in which these provisions are disobeyed. The importance of cordial coöperation between the officers of the sanitary authority and the public vaccinators and vaccination officers in carrying out the requisite precautionary measures is emphasised.

*Unofficial Pamphlets.*

While the memoranda summarised above are designed to remind medical men acting as public servants of their powers and duties, certain unofficial pamphlets have been issued.[1] Two by Dr. W. Wanklyn are of especial value. The Research Defence Society, 11, Chandos-street, Cavendish-square, W.1, are prepared to supply one, entitled "Small-pox and Vaccination," which will be gratis for distribution. Meanwhile, though there is no reason to anticipate a serious spread of the Poplar epidemic, the number of cases under treatment at the small-pox hospitals of the Metropolitan Asylums Board on Oct. 31st was 36 and has remained approximately at this level. But when so many men, women, and children are unprotected by vaccination, even some 40 cases among several million inhabitants must not be ignored as unimportant, and the issue of instructions, warnings, and informative pamphlets is timely.

## THE HEALTH OF THE NAVY IN 1915.

WE have received lately the Official Report on the Health of the Navy in 1915.[2] It is to be regretted that the issue of such a book should be so long delayed. Such reports, whether emanating from the Admiralty or War Office, are far more valuable if issued before their lessons have, by the advance of science, become stale.

In spite of the long delay the returns for the Royal Naval Division's Expeditionary Force are not even now included, as the figures are incomplete. However, we welcome the Report for 1915, if only because we cannot hope for the Reports of the more recent years till these earlier ones have been cleared out of the way. We regret to note an enormous increase in price. The Blue-books for 1913, 1914, and 1915 are practically identical in size and appearance, but the following table shows the contrast in cost between the recently issued health reports of the Army and Navy with their predecessors:—

| | *Army.* | | | *Navy.* | | |
|---|---|---|---|---|---|---|
| | Price. | | | Price. | | |
| | *s.* | *d.* | Issued. | *s.* | *d.* | Issued. |
| 1913 | 2 | 6 | May, 1917 | | 6½ | Nov., 1914. |
| 1914 | 10 | 0 | May, 1921. | 1 | 6 | Oct., 1920. |
| 1915 | — | | Not out yet. | 7 | 6 | July, 1922. |

The prices are, doubtless, due to the elaboration of the tables. The 1915 report is severely statistical, with even less comment to guide the reader through its mazes than in 1914.

*The Incidence of Disease.*

The total force employed and reported on in 1915 had increased from 158,300 in 1914 to 236,500 in 1915. Wounds in action were 3923, with 78 invalidings and 2563 dead, losses materially fewer than in 1914, there being, fortunately, no disasters to report such as the torpedoing of the three cruisers and the battle of Coronel, but 586 men were lost with the *Formidable* on Jan. 1st, 15 were killed and 35 wounded in the action off the Dogger Bank, and the operations in the Dardanelles continued to take their toll throughout the year with 1768 wounded and 949 deaths. Local injuries were increased this year, for amongst them were included the 396 men of *Natal* and 274 of *Princess Irene* who were on board when those ships blew up. For every 1000 men employed there were 620 cases of illness (131 of them wounds or injuries), with 24 invalidings and 22 deaths. Wounds in action were halved (16 instead of 32), injuries remained the same, (115), venereal disease had greatly diminished, not only in number of cases (67 instead of 73) but in damage done, shown by there being 2·57 sick daily per 1000, instead of 3·77. Each case lasted this year an average of 14 days, compared with 19 in 1914. The only increase this year was in diseases, from 588 to 621, the death-rate from this cause rising from 2·7 to 3·6, and the days lost from 12·2 to 15·5. The increased death-rate was due chiefly to the 67 deaths from cerebro-spinal fever.

The naval forces, as arranged in the tables, fall naturally into three great groups, the largest, the Grand Fleet, 127,400 men, on active service at Scapa or in the North Sea; the Fleets Abroad, 55,500 men; and the Home Station, which includes the depôts and training establishments, 53,600; all together constituting the "Total Force" of 236,500 men, from which are still excluded, for no obvious reason, the 9100 men at Marine headquarters whose particulars of illness are given in two separate and in some degree contradictory tables on pp. 162 et seq. and 179, where on p. 167 the average sick daily is stated as 263, but on p. 179 as 218. There seems also to be uncertainty whether the number of marines who died at headquarters in this year was 47 or 42. In the three great groups mentioned the highest proportion of loss of service by illness is shown by the Home Station, which includes the training ships at the junior end, though no mention is made of the cadets at Dartmouth; the group has at the other end all the oldest sailors who are awaiting discharge, and it shows a great excess of entries for disease. The Grand Fleet is again this year the healthiest of the groups (showing as before that service at sea is not nowadays of itself unhealthy), though its death-rate has risen. The section "Fleets Abroad" has the highest death-rate owing to the operations in the Dardanelles, while enteric fever, dysentery, and malaria also materially increase here the number of cases of disease. The most important health statistics of these groups can be seen in the table. All the sick-rates spoken of are merely crude sick-rates, with no chance of standardisation for age, as the instructive tables of sickness by ages, formerly the distinctive feature of the Naval Health Return, and so rarely to be obtained elsewhere, are no longer published by the Naval Medical Department.

*Proportional Incidence of Disease in the Royal Navy for 1915.*

| — | A Training establishment | B Grand Fleet. | C Fleets abroad | D Home station | E Total force. | F Marine hdqrs. |
|---|---|---|---|---|---|---|
| Number in group | 3200 | 127,400 | 55,500 | 53,600 | 236,500 | 9100 |
| Wounded or killed in action | — | 12 | 36 | 6 | 16 | 11 |
| Other injuries | 40 | 109 | 1·43 | 98 | 115 | 153 |
| Venereal disease | — | 53 | 65 | 102 | 67 | 22 |
| Other diseases | 921 | 312 | 485 | 621 | 422 | 760 |
| Total cases, disease and injury | 961 | 486 | 729 | 827 | 620 | 946 |
| Invalided out | 13 | 16 | 11 | 55 | ·24 | 56 |
| Deaths | 7·5 | 20·4 | 37·8 | 9·7 | 22 | 5 |
| Sick daily | 36 | 18 | 25 | 28 | 22 | 29 |
| Loss of service per man in days | 13 | 6·7 | 9·3 | 10·4 | 8 | 10·5 |
| *Individual Diseases.* | | | | | | |
| Pneumonia | 30 | 2·8 | 2·0 | 8·9 | 4·0 | 3·8 |
| Tubercle | — | 1·9 | 3·3 | 4·2 | 2·7 | 5·2 |
| Catarrh, sore throat and tonsillitis | — | 85 | 84 | 184 | 107 | 208 |
| Rheumatic fever | 5 | 5 | 6·3 | 9·2 | 6·3 | 10·6 |
| Enteric fevers | — | 0·4 | 6·2 | 0·8 | 1·87 | 0·77 |
| Appendicitis | — | 2·4 | 1·9 | 1·7 | 2·1 | — |
| Chancroid* (18%) | — | 5·4 | 5·9 | 12 | 8·3 | 2·2 |
| Syphilis* (9%) | — | 4·4 | 3·4 | 5·5 | 4·4 | 1 |
| Gonorrhœa* (73%) | — | 29·1 | 32·8 | 47·7 | 34·2 | 12·1 |
| New cases V.D. | — | 38 | 42 | 65 | 47 | 15 |
| Scabies | 6·2 | 9·4 | 5·6 | 32·2 | 13·9 | 9·9 |

* New cases.

Column A is included in Column B. Column E is the aggregate of Columns B, C, and D. Column F is not included in Column E.

*Certain Individual Diseases.*

When individual diseases come to be considered the first is cerebro-spinal fever, of which there were 115 cases in the total force, with 67 deaths, 35 at Marine headquarters with 11 deaths, and 48 in the Royal Naval Division at the Crystal Palace with 6 deaths—a serious disease. In the total force the

[1] A Survey of the Present Position of Small-pox and Vaccination as Affecting this Country and Facts that You Ought to Know about Small-pox and Vaccination. Geo. A. Wareham, Cheapside.

[2] Statistical Report of the Health of the Navy for the Year 1915. London: Published by H.M. Stationery Office. 1922. 7*s.* 6*d.*

incidence was 0·48 per 1000, but on the Home Station 1·82, in the depôts 1·94, and it was high in the boys' training ships, 6 per 1000 on the *Ganges* and 10 per 1000 for *Impregnable*. The case incidence in the Grand Fleet was low, 0·1 per 1000, but the mortality (11 in 13 cases) was very high; only one ship returned as many as two cases. Nothing is said as to methods of prevention or treatment.

Enteric fevers are differentiated into enteric and paratyphoid A and B, but nothing is said about the routine for discrimination, or about the relation of the 446 cases to prophylactic vaccination, except that three-quarters of the cases in the ***Exmouth*** were in non-inoculated men. These cases mostly arose in the Dardanelles area; why nine men were allowed to be on board a ship in that area uninoculated is not explained. From the low mortality we are inclined to suppose that some of these cases must have been protected, but this remains unstated for the 383 cases of enteric fever, except for the three from the *Exmouth*. A series of 13 enteric cases occurred on board H.M.S. *Carnarvon* at Montreal when water was being supplied to the ship by the City of Montreal Water Company. The epidemic ceased when water was procured from an artesian well. As only 13 cases occurred among 705 persons there was a great opportunity for demonstrating what protection was given by anti-typhoid inoculation. Dysentery caused 951 cases with 54 deaths; emetine treatment of bacillary dysentery gave "excellent results."

Pneumonia (958 cases, 137 deaths, case mortality 14 per cent.), with lower mortality than cerebro-spinal fever, but yet causing more deaths, was less prevalent, but the number who died was greater. The incidence on "Fleets Abroad" was 2·0, on the Grand Fleet 2·8, on the Home Station 8·9, on the large depôts 9·5, on the *Ganges* and *Vivid* training establishment 16, and on the *Impregnable*, also a training ship, 33·49 per 1000 of complement. No comment on these figures is offered; an incidence of pneumonia of 3½ per cent. in a training ship of boys is somewhat remarkable. There were 22·16 per 1000 in 1914 and 48·16 per 1000 in 1913 in this same ship. The deaths in the training service are not mentioned, only that 68 cases occurred in *Impregnable* and 29 in *Ganges*. As to tuberculosis 653 cases, 487 invalids, 61 deaths (per 1000 men, 2·76, 2·05, 0·25) are recorded, the incidence being increased this year by 30 per cent. This increase is nearly all on the Home Station. No attention is directed to this very unfavourable change. The table which used to show the percentage incidence of tuberculosis on the various groups of men in the Service has been slightly altered this year and is in its present form a little misleading; formerly it showed the distribution in the Navy of the cases which had occurred, now it shows only the distribution in the Navy of the invalidings and deaths. It is stated (p. 5) that 487 cases were invalided and 61 died = 548, but the table shows 562 and no explanation of this discrepancy is offered. That diseases of overcrowding, cerebro-spinal fever, pneumonia, and tuberculosis, should have occurred in 1915 when the Navy expanded itself by 50 per cent. was inevitable, but we would have been glad to have seen a statement of the steps taken to remove this danger in subsequent years.

It would be an interesting research to ascertain how many of the 653 tuberculous cases, of which 560 were pulmonary, occurred among the probably 40 per cent. of newly joined men who served in the Navy in this year. Did these cases arise in newly entered men or in men who had been serving in the Navy previously, and in what proportion? The Navy has been taking great and ever-increasing care to shield its people from the infection of tubercle; nearly all the cases of tubercle which are definitely diagnosed are very quickly invalided, for their own sakes and for the benefit of the others. The average time under treatment of a case of tuberculosis within the Service was, in 1913, 90 days, in 1914, 80 days, and in 1915 about 55 days; thereafter they are retained in naval hospitals until permanent arrangements can be made. This scheme should reduce the number of infections arising within the Service. In 1914 there were 19 boy tuberculous patients, in 1915 there were 39 boy invalids. It seems more likely that a boy developing tubercle in the course of his short period in a training ship will have brought it with him rather than that he has been infected in the Service, and that his disease has progressed so far as already to compel his invaliding. If all the boys were weighed weekly, and their weights noted continuously, some light might be got on the question of time of origin and duration of tuberculous infections. As the number of boys required in 1915 was materially increased, it is probable that automatically the standard fell slightly, and more border-line cases were admitted. The increase of tuberculosis is evenly spread over all the large groups of men; the sick-berth staff, however, has the evil pre-eminence amongst the middle and larger groups, but figures include both open and closed tuberculosis.

Venereal disease greatly decreased in 1915; still there were 15,868 cases. It was most prevalent on the Home Station (102 per 1000), less in the Fleets Abroad (65), less in the Grand Fleet, and least in the Marine headquarters. There were fewer cases and also fewer days on the sick-list for each case; they averaged 20 days' treatment in 1913, 19 days in 1914, and 14 days in 1915 for the Service generally, but 15 days in the Grand Fleet and 12 days in the Home Station. Thus, in 1915 venereal disease, instead of accounting for one-third of the days' sickness of the fleet as formerly, accounted for only one-eighth, a great credit to the medical officers who have brought this change about by lectures and improved treatment. In every 100 fresh infections 18 were chancroid, 9 were syphilis, and 73 gonorrhœa.

### *Figures of the Training Service.*

As to the Training Service, statistics cannot be completely subtracted this year from the Blue-book, for the *Powerful* is not included with the others on p. 170, where the tables are besides a little confusing. The average number of sick daily in the *Impregnable* is understated, the days sickness from injury not having been included, and there seems to be a great uncertainty as to the total number of men belonging to the *Impregnable* on which the percentages are calculated. On p. 84 that number is given as 1845, on p. 170 as 1553. There were 68 cases of pneumonia, which would make the percentage incidence 4·37, whereas it is given as 3·349, which corresponds to a total complement of 2030; further 74 cases of rheumatic fever are stated, which with a percentage incidence of 4·7 as stated, corresponds to a complement of 1574. These uncertainties make it difficult to realise what did actually happen, particularly when a report is, like the present, so exclusively statistical. Is there a confusion between the boys and the ship's company? A separate table of statistics for the diseases occurring among the various training units, not forgetting the Dartmouth cadets, would give the Naval Medical Department the credit that is their due, and the statistics of the Service generally would become more definitely those of the Service afloat.

### *Some Lessons.*

The great lessons of this report are that venereal disease was in 1915 decreasing in the Navy, and that the rapid expansion of the Service had caused more numerous cases of the diseases of overcrowding; we trust that the report for 1916 will show that this later problem had been successfully handled, and that that report will speedily appear.

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ROYAL PORTSMOUTH HOSPITAL.—An appeal by the Mayor of Portsmouth to free the Royal Portsmouth Hospital from debt has been most successful. A cheque for £7000 from the local carnival committee, raised by a series of entertainments and exhibitions, and one for £1000 from the Mayor's Charities' Fund, were presented to a representative meeting of the governors held on Nov. 2nd in the Town Hall. This donation of £8000 will pay off the present overdraft and assist in placing the hospital on a self-supporting basis.

## THE MOTOR EXHIBITION:

### REAL PROGRESS MADE DURING 1922.

AT the annual exhibition organised by the Society of Motor Manufacturers and Traders, Ltd., which closes to-day (Saturday), some 500 firms representing Great Britain, France, Belgium, America, and Italy are showing their products. These range from small two-seaters to luxurious limousine and sedan types, and are divided without classification between Olympia and the White City. On the analogy of vintage years, 1923 can be described as an exceptionally promising one for motor-cars. The year 1919 produced many freaks, most of which have by now vanished. In 1920 many cars were on show, but few ready for delivery, while last year strikes interfered with quality as well as quantity. This year real progress seems to have been made.

Many of the well-known makers cater for at least three different types of client—those who want a little runabout for less than £300, those who are prepared to spend between £300 and £500, and those who do not object to a capital outlay of over £500 for a durable car. In the first of these classes is the popular two-cylinder 8 h.p. Rover, now purchaseable for £180, with two-seater body, and £190 with a body built to hold two children or one adult at the back. The Standard four-cylinder 8 h.p. can be obtained for two persons inside and two in dickey, at £275; the 7 h.p. four-cylinder Austin is priced at £225. The Humber 8 h.p. four-cylinder model (£275) also contains in the space between the back of the car and the front seats a small children's seat, which is detachable, so that luggage can be carried there if desired. The Talbot-Darracq show a 8–18 h.p. four-cylinder chassis, fitted with two-seater body, with dickey seat for £285. The Wolseley 7 h.p. two-seater is priced at £255. The Morris Cowley provide a serviceable little two-seater for £225, one fitted with a self-starter for £255, and a four-seater for £275. The G. W. Hands four-seater at £294, and the Surrey "large" four-seater at 285 guineas, appear to give good value. The Citroën, the Jowett, the Stoneleigh chassis with different bodies, the 10 h.p. Singer, the Eric Longden (carrying a three years' guarantee), the B.S.A. "Popular" at £230, and very many other excellent models are shown.

Nearly all these firms show also cars of between 10 and 14 h.p., with roomy four-seater bodies, well fitted with accessories, for prices varying between £300 and £500. Certain other makers only start their models at this level. The Clement Talbot 10–23 h.p. complete for £375 is an attractive car. The Waverley, Renault, Fiat, Calcott, and Auto-Carrier companies provide models no less fascinating. The Rover 12 h.p. and the new Humber model, only slightly above the £500 mark, are well worth consideration from those who desire to limit themselves approximately to this figure. Humber cars are fitted with a neat window-cleaning device with a double action, and the tools in common use are stored under the bonnet. Of the higher-priced cars we need say little. De Dion, Vauxhall, Sunbeam, and Daimler models demand attention, and pictures of the new Rolls-Royce, not yet on show, give promise of a good bargain for those who can afford the initial outlay.

#### *Body Work and Accessories.*

The coach-work in general appears much more finished than in recent years. The Connaught Motor and Carriage Co., Hooper and Co., Barker and Co., Howes and Sons, and Offord and Sons show good examples. Messrs. Brown Bros. show Duco leaf spring gaiters, Gabriel rebound snubbers, and other shock and rebound absorbers specially designed for Ford cars. The Lucas Electrical Co. show lighting and starting sets. An interesting exhibit is the new magneto of the British Lighting and Ignition Co., in which the magnets revolve and the armature is stationary. Dunlops show the new cord tyres. Harvey Frost exhibit their vulcanisers, of use in the economical maintenance of tyres; the Schrader tyre pressure gauge should also be of help in this connexion. A useful device for driving in wet weather is the Dekla screen-wiper. Plugs are always of interest, notably the new detachable K. L. G. shown by the Robinhood Engineering Co. The Triplex Co., to demonstrate the strength of their glass, show a screen which encountered a bullet in Dublin, and is said to have saved the driver.

The exhibits noted are only a few of those which must excite the interest of any keen medical motorist who visits Olympia and the White City. If any of these have not yet visited the show they should make time to do so to-day (Nov. 11th).

## MEDICINE IN U.S.A.

(FROM AN OCCASIONAL CORRESPONDENT.)

#### *American Child Hygiene Association.*

THE American Child Hygiene Association held its annual meeting at Washington from Oct. 12th to 14th. An important decision taken at this meeting was the final ratification of an agreement by which this association becomes definitely united with the Child Health Organisation of America. As Dr. L. Emmett Holt, the president of the latter body, remarked in the course of his review of the situation, this union is symptomatic of the present tendency in the United States to coördinate the work of the various voluntary societies working for public health and welfare. Up to the present the first of these two societies has been concerned especially with infants and the pre-school period, while the second has taken care of the older children. The division is an arbitrary and largely artifical one, and a single organisation, by pooling resources, should be able to make better use of the available funds. Mr. Herbert Hoover, retiring president of the Child Hygiene Association, announced that, aided by the Commonwealth Fund, the Association would undertake in three selected cities of the United States "a complete demonstration in every avenue of protection of child health." The sums guaranteed amount to $230,000 per annum for a term of years. This again is a sign of the times. The local demonstration is of particular value here because under the Constitution of the United States the Federal Government has very limited powers of interference in the control of public health. Such powers as they have are derived from a provision which gives Congress control over foreign and inter-state commerce and from a certain much-debated amendment to the Constitution which gives to the Federal authorities the power to control the consumption of alcohol. The great success of the demonstration financed by the Metropolitan Life Insurance Company at Framingham has proved that this method is one of the surest ways of arousing local—i.e., State—health authorities to a sense of their opportunities and duties. There is no doubt that rapid advances are being made. Since 1918 the State bureaux of child hygiene have increased from 28 to 46, and in the same period infant mortality has fallen in the registration area from 106 to 78 per 1000 births.

#### *American Public Health Association.*

A number of interesting papers were read at the fifty-first meeting of this Association, which was held at Cleveland, Ohio, from Oct. 16th–19th. There was a strong plea for the recognition of the food and vitamin value of milk—a very fashionable cry over here at the present time. A more original contribution was that of Mr. Willard E. Ward, food inspector for the city of Brooklyn, Mass. He would make "food economics" a compulsory subject in all the public schools, while municipal food centres should be established for the education of the public. All food-handlers he would have placed under adequate medical supervision. The Californian law which makes it illegal to retail butter except in package form should be generalised. There is a great deal to be said, in this country at any rate, in favour of stringent protec-

tion of foodstuffs from the various infecting agencies through which they are liable to pass before they reach the consumer.

Mental hygiene had a place in the programme. A paper by Dr. H. J. Howk, the assistant medical director of the Metropolitan Life Insurance Company, must be mentioned on account of the very creditable record which Dr. Howk presented of the work of the company's Tuberculosis Sanatorium at Mt. MacGregor, N.Y. The sanatorium has been in use for the tuberculous members of the 27,000 odd employees of the company since 1913. Up till Jan. 1st, 1922, the institution had cared for 1319 cases of tuberculosis. Of all cases that have left the sanatorium 80 per cent. are now at work, 10 per cent. are unable to work, and 10 per cent. have died. This remarkable success is attributed by Dr. Howk to the high percentage of incipient cases now received (70 per cent. in 1921 as compared with 29 per cent. in 1914).

The most valuable papers were undoubtedly those read in the vital statistics section. Dr. Raymond Pearl welcomed the growing tendency of the public to inquire into the cost of health schemes because this interest will make it necessary to institute energetic and honest research into their efficiency. Such research is needed. By it Dr. Chapin found that the value of fumigation was exactly zero. Again, it was an honest conclusion of Drs. Levy and Freeman in Richmond, viz., that a strenuous application of the usual methods of public health control were not controlling the summer mortality of infants, that led them to try a new and unorthodox method—the boiling of diapers and thereby to achieve substantial success. The statistical method is valuable because properly handled it is capable of exact measurement of the value of different procedures. But to achieve his full usefulness the vital statistician must have more data than he is given at present. Mortality statistics cannot be used as a fair measure of the effectiveness of public health work which is truly measured rather by morbidity statistics. "We have 'Boards of Health' not 'Boards of Mortality'—and quite rightly so." On the other hand, Dr. Pearl is not in favour of trying to express in dollars and cents the exact value of any piece of public health work. "Much, if not most, of the valuable accomplishments of public health work are not measureable or even expressible in dollars and cents. What is the worth to me in money that my children will not have diphtheria or small-pox?" Two quite independent authorities, quoted by Dr. Pearl, have each arrived at the sum of five hundred million dollars as the cost to the United States in the one case of tuberculosis and in the other of the depredation due to rats. The money-value of public health work must be recognised as an incomplete story, and if so recognised may still have its value.

Frederick L. Hoffman, the chief statistician of the Prudential Insurance Company of America, read a very suggestive paper in which he pointed out the lack of data concerning patients who have undergone surgical treatment in hospital. This paper was a report of the Committee on Institutional and Hospital Statistics set up by the American Public Health Association. From the report it appears that many hospitals in the Union have invented their own system for following up surgical cases, though none have proved entirely adequate. As a result it is impossible to form definite conclusions regarding the form of treatment at present employed and many valuable data, for example, those concerning the success or failure of operative treatment for cancer, are lost. The method of follow-up now used at the Collis P. Huntingdon Hospital at Boston was recommended as a "basis for improvement."

This section had the advantge of hearing Dr. W. H. Davis, chief statistician for vital statistics of the Federal Census Bureau. The registration area for mortality now includes 93·3 per cent. of the population and that for births 66·1 per cent. Two more States were included during the past year in the birth registration area—namely, Wyoming and Montana—bringing the total of States so included up to 29.

*Research Work at Johns Hopkins.*

The tradition of Johns Hopkins Hospital for the production of original work is well maintained. Three papers based on original research were read to the Medical Society at its first meeting in the academical year on Oct. 16th last. The most important was that presented by Prof. E. K. Marshall and Dr. J. L. Vickers on the mechanism of elimination of phenolsulphonephthalein (p.s.n.) by the kidney. The staining properties of this indicator are not its most valuable asset, for it was found in the course of experiments that in the animal serum a large part of phenolsulphonephthalein is combined, a proportion varying between 25–40 per cent. only being recoverable by ultra-filtration. First repeating Heidenhain's experiment with the dog—i.e., reducing blood pressure below 40 mm. by appropriate destruction of the cord—Prof. Marshall was able to show that when no urine was passing through the kidney there was nevertheless a concentration of phenolsulphonephthalein 30 to 300 times greater in the kidney than in other organs of the body. He then calculated the amount eliminated from the kidney of a physiologically normal dog in a given time and showed that more phenolsulphonephthalein had been eliminated in this time than could have been carried by the blood-stream to the kidney in the time of the experiment, even supposing that all the p.s.n. had been in the crystalloid state. This pointed conclusively to a piling up of p.s.n. in the kidney, and histological examination also showed the cells of the convoluted tubules heavily pigmented therewith. Prof. Marshall concludes that the adsorption of p.s.n. by the proteins of the kidney is greater than its adsorption by the proteins of the blood. If this explains one half of the secretory power of the tubules (supposing they have any secretory power) no explanation is furnished as to how the p.s.n. is given up at the other side of the tubule cells to a watery solution free from proteins. This problem was stated by Prof. McCallum, but no solution was suggested. It is difficult, however, to explain the experimental results on any other supposition than that of active secretion by the kidney tubules.

## VIENNA.

(FROM OUR OWN CORRESPONDENT.)

*The Medical Faculty of the University of Vienna.*

SPECIAL statistics have been published by the Board of the Medical Faculty of the University of Vienna showing the figures of medical students and of the personnel of the faculty since the formation of the Republic. It appears that the actual number of students does not differ much from the figures found in the last peace years, but the proportion of Austrians to non-Austrians has changed materially. The winter session is generally frequented by about 3500 students, the summer session by about 3000. Whilst in former times the overwhelming majority were Austrians, since 1919 a marked rise in foreign students is discernible. In the summer session of 1920 and the following winter over 60 per cent. were of Slav nationality, Roumanians, or came from overseas. This overcrowding by foreign students was in part responsible for the attempt to restrict the influx by fixing the number of admissible first-year students at 400. This measure was also partly prompted by anti-Semitic motives, since a number of medical students are Jews from Poland and Roumania and Hungary, who cannot study in their respective countries. The native student is somewhat handicapped by an undue number of foreigners, but the authorities put no obstacles in the way of students desiring to graduate in Vienna, if they pledge themselves not to practise in Austria but to return to their native country after qualification. In 1918 only 247 students (including 38 women) obtained their diploma of M.D., in 1919 the figure rose to 350 (including 38 women), in 1920 the number was 440 (including 70 women), and in 1921 475 (including 70

women). The percentage of non-Austrians rose markedly in these years, being 30, 38, 47, and 56 respectively. These figures show how important a part is that played by Vienna in disseminating knowledge in the eastern and south-eastern countries of Europe. Bulgaria, Ukraine, Poland, Roumania, and Serbia owe much of their present medical advances to the influence of Vienna. Whatever attempts may be made to nationalise University study, such an old organisation as that established at Vienna would not soon lose its far-reaching influence. The programme for the coming session has just been published and gives a good conspectus of the work proposed for the medical students. Thus 481 different lectures and classes are announced in the faculty of medicine. A staff consisting of 26 ordinary, 118 extraordinary professors, and 148 privat-docents and assistants are engaged in this teaching work. The fees for these classes vary according to the nationality of the students; the non-Austrians have to pay five times as much as the natives. Apart from the undergraduate curriculum, a large number of post-graduate classes will be given, open to all medical men, according to a special post-graduate programme issued quarterly. The fees for these post-graduate classes are uniform for all applicants; owing to the large proportion of English-speaking (mostly Americans) attending them, the majority of such classes are held in English.

*The Physiology of Plants.*

At the recent meeting of the German Botanic Society, which took place in Vienna on Sept. 25th–27th, some interesting papers were read. Thus Boas (Germany) read a paper on his researches on the effect of saponins, substances which resemble the poisons of serpents in so far as they produce hæmolysis when brought in contact with blood. These substances are frequent in nature; they act upon the lipoid covering of the protoplasm in cells and thus all living cells require a separate covering layer. If the osmotic conditions are changed, severe disturbances may follow. Netolitzky (Czernowitz) read a paper on the protective means of plants, which consist partly of mineral inclusions, and partly of covering strata. The seeds of plants contain especially the latter, in order to prevent the loss of vital substances. Very interesting experiments, conducted by Knoll (Vienna) with butterflies, chiefly the moro-sphinx and swallow-tail, show the importance and influence of colours and shapes in the transmission of pollen. Knoll proved that certain colours and shapes attract the butterfly, whilst the same food, if offered in a colourless or in a shapeless form is neglected. The effect of irritation on budding was dealt with in a paper by Richter (Brünn). By immersing twigs and branches in concentrated acids and then washing them thoroughly, he succeeded in hastening budding. The unknown assimilative action of the "chloroplasma" was the subject of very instructive experiments described in a paper by Portheim and Eisler (Vienna). As is well known, only the green cell of the plant can form organic substance from water and carbonic acid. The plasma alone or the green pigment alone cannot do that. The two investigators have brought together extracts of green leaf with solutions of albumin, and thus obtained "chloroplasma," which could assimilate water and $CO_2$ if exposed to the influence of light. It exhaled oxygen whilst apparently absorbing $CO_2$; in fact, it behaved like a green plant. The authors state these facts, while cautiously avoiding any further claims; but it is interesting that the secret of the green plant has been, if not discovered, at any rate approached. These experiments were conducted at the Biological Institute at Vienna, where another series of original tests were made concerning the new formation of organs under variable climatic influences, by changing the quality of food or the prevention of transportation of food by the normal route. Certain plants (peas, beans) can produce the substitutes for such organs that are required in the ordinary course of their life if external influences necessitate it.

*Collection of Lantern Slides for Public Lectures.*

The Ministry of Public Health has caused 800 excellent lantern slides to be collected and held at the disposal of medical men desirous of giving public health lectures with the help of these instructive pictures. The topics dealt with are: (1) Fight against tuberculosis; (2) venereal diseases and their prevention and cure; (3) animal parasites in man; (4) the problems of correct feeding of the infant and the adult; (5) hygienic problems of to-day; (6) bacteriology; (7) anatomy and physiology of man; (8) the dust and its dangers; (9) electricity and its dangers; (10) industrial injuries; and (11) poisons and intoxicants. All the slides have already been used in several series of public lectures, and their employment in education is encouraged by the Ministry. A large lantern or projecting apparatus is lent to doctors, if they lecture in Vienna itself. Now that the anti-alcohol and anti-syphilis movements have come into prominence, the slides will be of special value. In lectures given to the members of the Republican militia, to the students before leaving the upper classes of the higher schools, and to clubs for adolescent labourers of both sexes, the slides have been most useful.

# The Services.

## ROYAL ARMY MEDICAL CORPS.

Lt.-Cols. T. C. Lauder and P. H. Collingwood retire on ret. pay.

Maj. A. C. H. Gray retains the temp. rank of Lt.-Col. whilst empld. as Asst. Dir. of Pathology.

Capt. J. R. Hill to be Maj.

Capt. H. S. Milne retains the temp. rank of Maj. whilst empld. as Dep. Asst. Dir. of Pathology, and Capt. A. Hood to be temp. Maj. while holding a similar office.

Temp. Capt. D. V. O'Malley relinquishes his commn. on appt. to the I.M.S.

### TERRITORIAL ARMY.

Capt. W. A. Robertson to be Maj.

Capt. Ll. McI. Weeks (late R.A.M.C.) to be Capt.

The undermentioned relinquish their commns. and retain their rank: Majs. A. H. Horsfall and E. F. Finch; Capts. W. W. J. Lawson, E. White, P. G. Doyne, P. W. Green, A. Mitchell, J. Millard, D. S. Twigg, S. Thompson, and J. MacB. Taylor.

The undermentioned Capts., having attained the age limit, are retired, and retain their rank, except where otherwise stated: L. C. Bruce (granted the rank of Lt.-Col.), A. W. Bowie, and J. Young.

The undermentioned offrs. resign their commns., and retain their rank, except where otherwise stated: Lt.-Cols. T. Kay (granted the rank of Col., with permission to wear the prescribed uniform) and J. W. Leitch (with permission to wear the prescribed uniform); Maj. B. Addenbrooke (with permission to wear the prescribed uniform); Capts. G. Dalziel (granted the rank of Maj.), G. B. Eadie (granted the rank of Maj.), F. L. Napier, L. R. G. de Glanville, and Lt. D. M. Lindsay.

Capt. C. F. Searle to be local Maj. whilst serving with Camb. Univ. O.T.C.

### TERRITORIAL ARMY RESERVE.

Maj. F. A. Hadley relinquishes his commn. and retains the rank of Maj., and Capt. A. C. Young relinquishes his commn. and retains the rank of Capt.

Capt. W. E. L. Elliott, having attained the age limit, is retired, and retains the rank of Capt.

General Hospital: Maj. J. D. Comrie, from 2nd Scottish Gen. Hosp., to be Lt.-Col.

Sanitary Companies: Capt. A. E. Bonham, from San. Cos., to be Capt.

## INDIA AND THE INDIAN MEDICAL SERVICE.

The King has approved the retirement of Lt.-Cols. H. S. Wood and F. O. Kinealy.

Majs. Abdurrahman Khan Lauddie and C. A. F. Hingston to be Lt.-Cols.

The King has approved the relinquishment of their temp. commns. by the following officers, with the rank shown:—Capts.: Copal Chandra Ray, Kanhaya Lal Kapur, Kanavalal Naraindas Sonpar, Pherozshah Manekshah Taleyar Khan, D. T. P. Gay, and Palathnikal Varkey Cherian; Capts. permitted to retain the rank of Capt.: Khanderao Krishnarao Dhairyawan, Paul Xavier Godinho, Panikulam Varghese Francis, and Subbaraya Kumaraswami Pillai.

# Correspondence.

"Audi alteram partem."

## HUMANITY AND BUSINESS.

*To the Editor of* THE LANCET.

SIR,—I quote herewith a telegram received from Dr. Walter B. Cannon, Professor of Physiology in the Harvard Medical School:—

"Expert opinion from Harvard Law School states that the California game laws permit trapping with certain restrictions and these laws are not affected by the proposed Bill."

At the November election in California, the people will pass on a Referendum an Antivivisection Bill. This Bill expressly permits dehorning, spaying, and caponising, in order to catch the farmers' vote. In addition to this, the California game laws, as you see, permit the trapping of wild animals. The California Antivivisection Bill does not abolish this, and therefore permits this most cruel of all practices, in order to catch the vote of those who deal in peltry.

In the decision in the suit against the professors of the University of Pennsylvania, Judge Brégy announced the opinion that no operation on any living creature was permissible except for the benefit of that individual creature. This decision has been enthusiastically supported by the Antivivisectionists. Now, the California Antivivisection Bill neglects to abolish trapping and, as I have stated, expressly permits other cruel practices.

I am, Sir, yours faithfully,

W. W. KEEN.

1520, Spruce-street, Philadelphia, Pa., Oct. 23rd, 1922.

## THE MENSTRUAL CYCLE AND CALCIUM CONTENT OF THE BLOOD.

*To the Editor of* THE LANCET.

SIR,—During the last two years I have been working on the calcium content of the blood of women during the different stages of pregnancy. Interesting variations have been observed here, which led me also to investigate the calcium content of the blood in connexion with menstruation. In view of your recent leading article in THE LANCET (Nov. 4th) on this subject my figures may be of interest to you.

In the cases I have examined I have always taken one sample of blood midway between the periods, and another as soon as possible after menstruation has started, always within the first 24 hours. These results are given in the following table:—

| Case. | Calcium content of serum— | | | |
|---|---|---|---|---|
| | Midway between periods. | At time of menstruation. | Midway between periods. | At time of menstruation. |
| 1 | 1·03 | 1·1 | 1·07 | 1·23 |
| 2 | 1·03 | 1·2 | 1·07 | 1·15 |
| 3 | 1·09 | 1·04 | 1·15 | 1·00 |
| 4 | 1·08 | 1·09 | 1·07 | 0·95 |
| 5 | 1·19 | 1·17 | — | — |
| 6 | 1·16 | 1·14 | — | — |
| 7 | 1·1 | 0·99 | — | — |
| 8 | 1·04 | 1·12 | 1·05 | 1·04 |

Calcium content expressed as milligrammes per 10 c.cm. of serum.

Since the calcium content of the blood of pregnant women is at the commencement of pregnancy slightly higher than that of non-pregnant women, an increase in the calcium content of the blood during menstruation might be expected. Cases 1 and 2 give numbers which support this supposition, but the rest do not show any appreciable variation in relation to the menstrual cycle. Prof. Blair Bell[1] showed in two or three cases where he was able to take the blood from the patient over several days that the calcium content often suddenly rose before menstruation, to be followed by a very marked drop before the bleeding commenced, and continued through menstruation to rise and fall slightly, according to conditions, until it regained its normal value again. On the other hand, Sherman, Gillett, and Pope,[2] using a method which is much less open to criticism, could show no distinct monthly cycle in the metabolism of nitrogen, phosphorus, and calcium in the case of women. Although in Cases 1 and 2 there is a suggestion of a rhythmic rise and fall in the calcium content of the blood, the variations shown by the figures as a whole are not greater than those obtained in any normal series of estimations of the blood calciums, and do not support the idea of a cyclic variation in the calcium content of the blood.—I am, Sir, yours faithfully,

SIBYL T. WIDDOWS, B.Sc., F.I.C.

London (R.F.H.) School of Medicine for Women, Nov. 2nd, 1922.

[1] Proc. R. Soc. Med., 1908, vol. i., part 2, p. 291.

## THE LYMPHOIDOCYTE AND THE TÜRK CELL.

*To the Editor of* THE LANCET.

SIR,—Drs. Matthews and Pearson, writing from Liverpool in THE LANCET of Oct. 28th, state that "Türk's original description of these cells (i.e., 'Reizungsformen') was given in a monograph on the hæmatology of acute infectious diseases published in Vienna in 1898. We have been unable to find a copy of this work in this country." The title of the work referred to is "Klinische Untersuchungen über das Verhalten des Blutes bei Acuten Infectionskrankheiten," by Dr. Wilhelm Türk. Wien und Leipzig: Wilhelm Braumüller. 1898.

For the benefit of hæmatologists who may wish to consult this monograph, I may state that a copy has existed in the library of the Liverpool School of Tropical Medicine since the issue of the work in 1898.

I am, Sir, yours faithfully,

J. W. W. STEPHENS.

Liverpool School of Tropical Medicine, Nov. 2nd, 1922.

## ACUTE SUFFOCATIVE ŒDEMA.

*To the Editor of* THE LANCET.

SIR,—Dr. W. J. Tyson's article on Acute Suffocative Œdema of the Lung, in your issue of Oct. 21st, has again directed the attention of the profession to a somewhat rare but very grave class of cases. In THE LANCET for March 9th, 1918, there is a letter from the late Dr. Samuel West on Pneumococcal Bronchitis: Acute Suffocative Catarrh of the Adult. This was followed by a letter from Dr. Theodore Fisher, and in the issue for May 11th I wrote a letter recording some cases of this affection. In the few lines devoted to treatment by Dr. Tyson he omits any reference to the use of atropine, and the object of this letter is to insist upon the striking results which follow upon the administration of this drug. In a case described in my letter of May 11th the patient, a lady of 70, suffering from diabetes and valvular disease of the heart, was suddenly seized, while paying an afternoon call, with the most urgent dyspnœa and profuse expectoration of a frothy white fluid resembling soap-suds. When I saw her in consultation with Dr. F. W. Rix about an hour after the commencement of the attack, the patient's condition appeared desperate. Dr. Rix had already injected hypodermically 1/20 gr. of strychnine hydrochlorate. I at once injected 2 gr. of caffeine-sodio salicylate, followed by the injection of 1/100 gr. of atropine sulphate. Sinapisms were applied to the chest. Within half an hour I had the satisfaction of seeing an improvement in the patient's condition, and I heard later that she was able to be sent home the next day. Dr. Rix tells me that in a subsequent but less severe attack atropine had an equally good effect.

I am, Sir, yours faithfully,

F. DE HAVILLAND HALL.

Twickenham, Nov. 4th, 1922.

[2] J.B.C., 1918, xxxiv., 372.

## THE *BACILLUS ABORTUS* AND HUMAN ABORTION.

*To the Editor of* THE LANCET.

SIR,—The last edition of M. J. Rosenau's "Preventive Medicine and Hygiene" (p. 777) contains the following: ". . . . *Bacillus abortus* which may contaminate milk, . . . . but there is no evidence that it is harmful to man." I have known several outbreaks in this county, but I have never been able to trace any connexion with abortion in the human.

I am, Sir, yours faithfully,

SIDNEY BARWISE.

New County Offices, St. Mary's Gate, Derby,
Nov. 6th, 1922.

## THE PHYSICIANS' CODE.

*To the Editor of* THE LANCET.

SIR,—Following your annotation under this heading in THE LANCET of Nov. 4th, dealing with changes just made in the by-laws of the Royal College of Physicians of London, relating to membership of the College, may I be allowed to point out how these changes affect the present Members? The diploma of Member, which has ever since its institution given the status of physician, is now made a general practitioners' diploma, the conditions which restricted its holding to a pure physician being removed. It is apparently intended by the College to limit physicians to the body of elected Fellows. Members who have not been elected Fellows, but who have practised as pure physicians for many years, and who hold, some of them jealously, to the high ideal which the College embodies, now find themselves virtually deprived of their physicians' diploma, by a change made without their cognisance or consent.

I shall be glad to be corrected if I have misapprehended the facts.—I am, Sir, yours faithfully,

R. HINGSTON FOX.

Devonshire-place, W., Nov. 6th, 1922.

## "FORAGE" OF PROSTATE.

*To the Editor of* THE LANCET.

SIR,—No doubt English surgeons are well acquainted with the ancient practice of tunnelling the prostate, and are also familiar with the modern "forage." I doubt, however, if the latter procedure is fully appreciated in this country, nor is it advocated as an alternative to prostatectomy—for the relief of retention, in cases of hypertrophied prostate.

Possibly a brief description of my own case may be of interest. I am now in my sixty-eighth year, and have invariably enjoyed good general health. Some twelve years ago I first noticed frequency of micturition, which continued a few years, with occasional onsets of urgency. This condition was followed in time by hesitancy, diminution in the volume of the stream, and inability to project it forwards. These symptoms progressed up to recently, and, knowing that my ailment was hypertrophy, which was almost certain to increase, I consulted a specialist in urology. He advised that I should pass a bougie myself twice a week and observe results. However, not liking the idea of beginning a catheter life, and being sceptic as to the after-results of the only alternative, enucleation, I placed myself under the treatment of Dr. Georges Luys of Paris. After the usual superficial examination, he dilated my urethra up to No. 60 Bénigué, and then passed a special urethroscope, by which he obtained a complete view of the prostatic urethra, and was also enabled to see and control the manipulations of the electrode by which he subsequently reduced the obstructing prostate. He found two large mucous polypi, which he destroyed with the electro-coagulation cautery, and observed a slight hypertrophy of the middle lobe of the prostate. After a lapse of eight days, the original symptoms persisting, I then submitted to "forage." This operation consisted of four applications of the cautery to the middle lobe, the duration of each being about ten seconds. The resulting pain was not intolerable. A portion only of the offending lobe was subjected to the action of the cautery, and the denuded surface allowed to cicatrise. Twelve days later the final "forage" was undertaken, which completely eradicated all hindrance to a free flow of urine. In fact, before leaving the operation couch, my bladder was filled with warm boric solution, and I was astonished to see myself enabled to urinate freely and forcibly, for the first time after many years of anxiety. It is noteworthy that I was not confined to my room in the clinique, or retained in bed, except on the days of actual operation. The remainder of my time in Paris I spent in sightseeing and in mild walking exercises.

Two months have now passed since the last operation of forage, and I am perfectly well in every respect. I still micturate more frequently than normal, but there are no unpleasant sequelæ. Hardly one-third of my prostate has been removed, and the seminal appendages are uninjured. A full description of Dr. Luys's technique and a discussion of the indications for this treatment will be found in *Paris Chirurgical*, January, 1918. I understand that since the publication of this article Dr. Luys has operated on over a hundred cases of hypertrophy of the prostate with satisfactory results.—I am, Sir, yours faithfully,

ARTHUR FINEGAN, L.R.C.P. Irel.

Authors' Club, Whitehall Court, London, S.W.,
Oct. 27th, 1922.

## THE USE OF GOLD CAPS.

*To the Editor of* THE LANCET.

SIR,—A note of warning is overdue with regard to the indiscriminate condemnation of gold caps on molar teeth by so many medical men. It amounts almost to an obsession with some. That many gold caps are responsible for an insanitary mouth owing to faulty construction and application, is incontrovertible. That the well-made cap, well applied to a well-prepared though broken-down tooth incapable of further supporting a filling, is an effective and desirable substitute for extraction, is also incontrovertible. The gold cap was one of the most brilliant conceptions in dentistry for the preservation and utilisation of extremely defective molar crowns with good roots. If it has been taken advantage of by faulty workmanship, that is no reason for its general condemnation. In the search for a cause of some obscure dyspeptic, rheumatic, or arthritic trouble "those gold caps must be removed" is becoming quite a medical shibboleth, to the detriment and discomfort of many a patient who has found the sacrifice of useful well-capped teeth unattended by the relief to their constitutional trouble sought for. The substitution of a denture does not improve the patient's chagrin at their loss.

Ill-fitting, septic, and defective gold caps should invariably be scrapped, but the line should be drawn and the medical man is well advised who leaves the decision to the dental surgeon.

I am, Sir, yours faithfully,

PERCY EDGELOW.

Devonshire-place, W., Nov. 6th, 1922.

ALVARENGA PRIZE.—The next award of the Alvarenga prize of the College of Physicians of Philadelphia, amounting to about $300, will be made on July 14th, 1923, provided that an essay deemed by the committee of award to be worthy of the prize shall have been offered. Essays intended for competition may be upon any subject in medicine, cannot have been published, must be typewritten, and if written in a language other than English should be accompanied by an English translation, and must be received by Mr. John H. Girvin, the Secretary of the College, 19, South 22nd Street, Philadelphia, Pa., U.S.A., on or before May 1st, 1923. Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author. It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award.

# Obituary.

## ALEXANDER CRUM BROWN, M.D., F.R.C.P. EDIN., LL.D. ABERD., GLASG., EDIN., AND ST. AND., D.SC. LOND., F.R.S., F.R.S.E.,

EMERITUS PROFESSOR OF CHEMISTRY IN THE UNIVERSITY OF EDINBURGH.

THE death of Prof. Crum Brown in Edinburgh on Oct. 28th in his eighty-fifth year severs a link with one of the most interesting periods in the history of the Medical School, for he was already a distinguished member of the academic staff in the "seventies," when the entry of women into medicine was focussing attention on the school.

Alexander Crum Brown was born in Edinburgh on March 26th, 1838, of a long line of theologians, his great grandfather being the author of the "Self Interpreting Bible." He was nearly 30 years junior to his half brother, Dr. John Brown, the author of "Rab and his Friends." Crum Brown was educated at the Royal High School, Edinburgh, at Mill Hill School, and later at the University of Edinburgh, where he graduated M.D. in 1861 with a thesis on the Theory of Chemical Combinations. His ingenious and practical bent was not towards medicine, and after taking the D.Sc. Lond. in the next year he decided to devote himself to chemistry. After several well-spent wander-years he was appointed extramural lecturer in chemistry at Edinburgh University, and in 1869 succeeded to the Chair of Chemistry left vacant by Prof. (afterwards Lord) Playfair. During a tenure of nearly 40 years Prof. Brown devoted himself, often in collaboration with Sir Thomas Fraser, to unravelling the connexion between chemical constitution and physiological action. His great versatility and his faculty of seizing upon the fundamentals of a problem soon earned for him a world-wide reputation as a philosopher, and this fame might have been even wider had it not been for an invincible innate modesty. In a paper read before the Royal Society of Edinburgh, which earned for him the Keith Medal, he elucidated the rôle of the semi-circular canals in equilibrating the body, and quite in his early days he constructed an ingenious instrument known as the "talking bottle" to reproduce the vowel sounds of the human voice. A good linguist, speaking French, German, and Italian, as well as having some command of the Scandinavian tongues, Russian, and Chinese, his wide reading kept him in touch with all that was being done in chemical science the world over, and he maintained the family tradition by taking part occasionally in the discussions of the United Presbyterian Synod and of the United Free Church Assembly. As a teacher Crum Brown is remembered by his pupils for his quick and vivid style and for the lucid way in which his subject was unfolded; wisdom flowed almost too rapidly from the master's lips. An old pupil writes: "The announcement of the death of 'Dear old Crummie,' as we all knew him, will sadden more than one generation of Edinburgh students, for although really known to few, Prof. Crum Brown was dear to all of us. How well one remembers his rather shy entrance into the classroom, his high-pitched voice, his gentle, deprecating courtesy, and the transparent and simple goodness of the man, and how well too, with a late remorse, our own often unruly behaviour. Though the true greatness of the man was hid from us—that a fortunate few of us learned later—and the extent and variety of his learning was a tradition among us rather than a matter of knowledge, yet we all loved him for what we divined through the veil. He was a man of deep conviction, and took an active part in all students' religious movements."

Prof. Crum Brown was an honorary graduate of the four Scottish Universities, a Fellow of the Royal Societies of London and Edinburgh, and twice president of the Chemical Society. He married Jane Bailie, daughter of Rev. James Porter, of Drumlee, co. Down, who predeceased him.

# Medical News.

UNIVERSITY OF CAMBRIDGE.—Under the will of the late Sir William Dunn a further sum of £15,000 accrues to the School of Biochemistry, so that the total grant for the purpose of the school amounts to £210,000. A University Lecturer in Embryology is to be appointed.

UNIVERSITY OF SHEFFIELD: THE FACULTY OF MEDICINE.—A course of post-graduate lectures on lines similar to those which proved attractive last year is now in progress. Two short clinical demonstrations on different branches of medicine and surgery are being given each Tuesday and Friday afternoon, and a number of special lectures and demonstrations are being held at the University by Prof. J. S. C. Douglas, Prof. J. B. Leathes, and Prof. E. Mellanby.

UNIVERSITY OF WALES.—At examinations recently held the following candidates were successful:—

PATHOLOGY AND BACTERIOLOGY.

David I. Bowen, Daniel A. Davies, Daniel T. Davies, Edith M. Davies (distinction), Leslie C. Edwards (distinction), Ann Ceinwen Evans, Martha Griffith, Elnion C. James, Thomas G. I. James (distinction), Emrys D. Owen (distinction), Thomas P. Rees, Muriel A. Stephens, William E. C. Thomas, and Constance Walters.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the Final Examination of the Conjoint Board, held from Oct. 3rd to 27th, the following candidates were approved in the undermentioned subjects, but are not eligible for diplomas:—

*Medicine.*—A. H. Abdel-Messih, Cairo and Manchester; J. W. Alden, Oxford and St. Thomas's; H. S. Allen, Cambridge and St. Thomas's; C. C. P. Anning, Cambridge and Leeds; C. H. Atkinson, Guy's; W. H. Bailie, St. Mary's; A. Barker, Cambridge and London; J. C. Bennett, London; Dorothy Bolton, Calcutta and Charing Cross; Eileen Mary Bronson, King's Coll.; Georgie Geddes Brown, Charing Cross; Mary G. Brown, London; G. H. Calger, Cambridge and St. Bart.'s; J. M. Clarke, Middlesex; I. H. Cohen, Leeds; G. G. Cooke, Birmingham; B. A. Crook, Bristol; J. E. D. Crozier, Cambridge and St. Thomas's; D. B. D'Alwis, Ceylon and Middlesex; S. J. Davies, St. Bart.'s; Gwladys Evans, St. Mary's; J. M. Evans, Bristol; M. W. H. Evans, Cambridge and London; R. V. Facey, St. Thomas's; Mary D. Fletcher, Univ. Coll.; K. V. Francis, St. Mary's; C. A. H. Franklin, St. Thomas's; Margery Freeborough, St. Mary's; S. L. Freedman, Univ. Coll.; A. Frost, Birmingham; R. M. Geldart, Cambridge and St. Bart.'s; Norah C. Goodbody, Birmingham; A. G. Hammond, Middlesex; J. Holroyd, Manchester; Madge W. Hubble, King's Coll.; A. Jephcott, Cambridge and St. Bart.'s; J. W. Joule, St. Bart.'s; Miriam A. Lawson, Royal Free; C. P. Ledward, Univ. Coll.; J. T. Linklater, Guy's; Eileen Mary Little, Birmingham; J. H. M. Lloyd, Guy's; J. I. Lyons and Phyllis C. Mackenzie, Westminster; M. Markiles, Guy's; J. Marley, Liverpool; Edith W. W. Marshall, Doris I. Mart, and G. O. Montgomery, Univ. Coll.; G. S. Morgan, St. Bart.'s; A. J. Morland, Univ. Coll.; R. M. Morris, London; H. Mould, Univ. Coll.; E. B. Murrell, Cambridge and St. Thomas's; J. N. J. Pacheco, London; E. S. Page, Cambridge and St. Thomas's; F. W. Pare, Manchester; Ellen Pateman, Calcutta and Charing Cross; Emily C. N. Paterson, King's Coll.; Ethel B. Poole, Westminster; Esther M. E. E. Rickard, Royal Free; C. E. Roach-Smith, London; J. A. L. Roberts, Bristol; H. N. Rose, St. Bart.'s; A. G. Silver, Middlesex; Helen O. Skelton, Royal Free; A. L. B. Stevens, Oxford and St. Thomas's; Blanchette Thomas, Charing Cross; B. M. Tracey, St. Bart.'s; Gladys M. Tullidge, St. Mary's; L. Unsworth, Manchester; F. S. Vaughan, London; Constance C. Watson, Charing Cross; Joan F. Whitelock, Univ. Coll.; Lina Marie C. Wingfield, Royal Free; and B. Zeitoun, King's Coll.

*Midwifery.*—R. H. Amm, Guy's; C. S. Anderson, St. Mary's; D. D. Anderson, St. Bart.'s; Katharine M. Andrew, King's Coll.; C. C. P. Anning, Cambridge and Leeds; Elizabeth E. Arkwright, St. Mary's; E. W. Arndt, Ceylon and Middlesex; J. Atkin, Guy's; G. F. Axon, Charing Cross; V. Barkin, St. Bart.'s; H. P. Baylis, H. C. Beccle, and I. J. Bechal, Guy's; J. Bee, London; L. J. Bendit, Univ. Coll.; Margery G. Blackie and Kathleen N. Blomfield, Royal Free; C. G. Bowen, Guy's; T. F. Briggs and M. A. B. Brito-Mutunayagam, St. Thomas's; F. Brockington, King's Coll.; A. Broido, Guy's; Violet W. Brown, St. Mary's; Dorothy E. B. Buckmaster, London; T. B. Butcher, St. Mary's; Kathleen F. Butterfield and Dora M. Cadman, Royal Free; E. H. P. Cave, King's Coll.; J. E. Clegg, Manchester; I. H. Cohen, Leeds; R. S. Coldrey, St. Bart.'s; P. S. Connan, King's Coll.; D. W. Crombie, McGill and London; C. K. David, Univ. Coll.; D. Davies, Guy's; M. Denman, Middlesex; G. S. W. de Saram, St. Bart.'s; Margaret B. M. Dewhurst, St. Mary's; V. P. de Zoysa, Ceylon and Univ. Coll.; G. A. Dolman, Cambridge and King's Coll.; W. Doorenbos, Leiden and Guy's; A. F. Doyle and W. H. Dunn, St. Thomas's; H. T. Edmunds, King's Coll.; D. G. M. Edwards, Univ. Coll.; H. C. Edwards, King's Coll.; J. O. Edwards, Liverpool; L. C. J. Edwards, London; A. J. C. Eland, St. Bart.'s; V. H. Ellis, London; P.

Ellman, Manchester; Marguerite Elman, St. Mary's; J. M. Evans, Bristol; V. F. Farr, St. Bart.'s; A. E. Fergusson, St. Thomas's; K. Fletcher-Barrett, Cambridge and St. George's; R. D. Flintan, Middlesex; C. S. Forrest, Manchester; K. V. Francis, St. Mary's; S. L. Freedman, Univ. Coll.; A. Frost, Birmingham; M. W. M. Gadrat, Paris; H. G. Goldwater, Middlesex; F. E. Graham-Bonnalie, Cambridge and Guy's; L. J. Green, London; S. A. Gunter, St. Bart.'s; Margaret C. N. Hadley, London; Rachel Halperin, Univ. Coll.; J. R. Hamerton, St. Bart.'s; L. Hamp, Birmingham; I. E. Harries, Guy's; J. S. Hawes, London; B. D. Hendy, Cambridge and London; D. B. Hitchings, Guy's; E. G. Holmes, Cambridge and St. Bart.'s; M. Honigsberger, Guy's; W. D. Hoskins, St. Thomas's; Dorothy M. Howse, Univ. Coll.; D. H. Hubbs, Guy's; L. D. A. Hussey, King's Coll.; C. Iszatt, London; M. Jackson, Guy's; R. Jackson, Cambridge and Middlesex; H. Jaffe, Manchester; F. James, Guy's; W. O. C. Jarratt, St. Thomas's; J. Jensen, London; H. V. M. Jones, St. Thomas's; R. D. Jones, Middlesex; J. P. Kies, St. Thomas's; Charlotte A. Kingdon, St. Mary's; C. de W. Kitcat, St. Bart.'s; G. L. S. Kohnstamm, King's Coll.; C. L. Kopeland, Univ. Coll.; D. Kostitch, King's Coll.; Edna Isabel Langston, Royal Free; A. L. Lankester, Cambridge and St. Thomas's; M. A. Lautre, St. Thomas's; Miriam A. Lawson, Royal Free; D. H. Lewis, St. Mary's; C. Libert, King's Coll.; J. H. M. Lloyd and N. L. Lloyd, Guy's; A. A. Lucas, Edinburgh; A. R. Macdonald, St. Bart.'s; W. McLaren, Durham; G. B. McMichael, St. Bart.'s; Dorothy B. Marling, London; R. G. B. Marsh, St. Thomas's; Edith T. Marshall, Royal Free; Doris I. Mart, Univ. Coll.; G. B. Matthews, Charing Cross; Margarethe Mautner, St. Mary's; M. S. H. Mody, Bombay and Middlesex; V. S. Monie, Edinburgh; W. B. R. Monteith, Cambridge and Univ. Coll.; J. H. Moorhouse, Liverpool; A. J. Morland, Univ. Coll.; A. L. te W. Naude, St. Thomas's; B. S. Nat, St. Mary's; E. Obermer, St. Bart.'s; Doris M. Odlum; St. Mary's; R. J. Oliver, London; Judith E. M. Ormerod, Royal Free; Jean Orr-Ewing, St. Mary's; Carrie H. Osmond, Bristol; R. Owen-Jones, Middlesex; E. S. Page, Cambridge and St. Thomas's; F. W. Pare, Manchester; W. Parry-Jones, London; Emily C. N. Paterson, King's Coll.; C. M. Pearce, St. Bart.'s; Florence M. Pearson, St. Mary's; R. P. Perera, Ceylon and London; A. C. T. Perkins, King's Coll.; R. F. A. Philpott, Oxford and St. George's; H. J. Plowright, Guy's; L. R. W. Price, Cambridge and St. Bart.'s; C. A. Probert, Guy's; Margaret E. Reid, Royal Free; M. Rose, Middlesex; B. E. Schlesinger, Cambridge and Univ. Coll.; I. I. A. Shaheed, St. George's; G. D. Shaw, Guy's; E. R. Smith, Liverpool; H. J. H. Spreadbury, Bristol; Betty Stainer and Constance S. Steele, King's Coll.; R. M. L. Still and R. G. Tame, Guy's; S. E. Tanner, Univ. Coll.; A. K. Tateson, St. Andrew's; F. C. M. Taylor, Charing Cross; B. M. Toop, London; B. M. Tracey, St. Bart.'s; A. Turner, St. Mary's; L. Unsworth, Manchester; S. Vatcher, Cambridge and London; A. S. H. Walford, Cambridge and St. Thomas's; Daisy C. Wallace, Charing Cross; E. H. Watkins, Oxford and St. Bart.'s; M. H. Webb-Peploe, Cambridge and St. Thomas's; R. Whillis, Cambridge and Univ. Coll.; L. E. H. Whitby, Cambridge and Middlesex; G. Wignaraja, Ceylon and Middlesex; M. C. Wilkinson and L. G. Williams, St. Thomas's; L. A. Willmott, St. Bart.'s; Lina Marie C. Wingfield, Royal Free; Constance A.P.Wood, King's Coll.; and T.Wooldridge, Guy's.

*Surgery.*—C. Abbu, Madras; G. R. M. Apsey and H. C. Beccle, Guy's; W. C. M. Berridge, St. Thomas's; W. G. Booth, Guy's; C. C. Bradsworth, Birmingham; T. B. Butcher, St. Mary's; H. G. R. Canning, Guy's; G. D. Clarke, London; D. H. Cockell and F. S. Coleman, St. Bart.'s; N. B. Cooke, Liverpool; W. F. Cooper, Cambridge and St. Mary's; H. Evans and A. W. Eyles, Guy's; W. E. Farnham, Birmingham; L. A. Finiefs, Paris and St. Mary's; H. S. Forbes, Univ. Coll.; L. Forman, Guy's; Marion Greaves, Leeds; Doris I. Harston, London; P. G. Harvey and M. Jackson, Guy's; T. James, St. Bart.'s; H. V. M. Jones, St. Thomas's; E. C. K. Kenderdine, Bristol; F. H. Leekam, St. Mary's; C. R. McClure, London; V. S. Monie, Edinburgh; R. G. Morrison, St. Thomas's; H. W. Needham, St. Bart.'s; Elizabeth M. Nicholson-Smith, King's Coll.; J. W. Perkins, St. Mary's; J. H. Plowright, Guy's; A. W. L. Smith, Manchester; R. M. Somerset, Sheffield; S. E. Tanner, Univ. Coll.; B. Teverson, St. Mary's; Kathleen E. Tresilian, London; M. Weinbren and D. B. Whitlock, Guy's; R. N. P. Wilson, Cambridge and Leeds; and J. Yates, Manchester.

**ROYAL COLLEGE OF PHYSICIANS OF IRELAND:** *Harry Godfrey Massy-Mills Prize*, 1922.—At a meeting of the President and Fellows of this College held on Nov. 3rd this prize was awarded to Dr. Michael Brandon Devane, who obtained over 80 per cent. of the possible marks in the Final Examination in Midwifery held by the Royal Colleges in March, 1922. The prize was established by Mrs. Massy-Mills in memory of her late husband, a Licentiate of the College, who died of wounds received in France in 1918.

**DEATH OF MR. R. J. MARTYN, OF SLIGO.**—One of the best known and most popular of West of Ireland practitioners, Mr. R. J. Martyn, of Sligo, died suddenly in London a fortnight ago, after an operation, at the age of 70. Having taken his qualifications at the Royal Colleges of Ireland, he settled in Sligo, where he practised for over 40 years. During the greater part of that time he was a dispensary medical officer, and for many years prison surgeon, and a magistrate for his county.

**VACCINATION IN IRELAND.**—Attention is at last being drawn to the neglect of vaccination of recent years in Ireland. Vaccination has long been compulsory in Ireland, without the exceptions permitted by law in England, and the agitation against vaccination has affected only small areas of the country. Up to a few years ago, therefore, Ireland could claim to be a well-vaccinated population. During the last few disturbed years, however, boards of guardians have been unable to enforce the law against parents who neglected to have their children vaccinated. The result is that a considerable proportion of children under 6 years of age is still unprotected. The dangers of the situation is now being publicly recognised, and newspapers are calling for a thorough enforcement of the law.

**ROYAL INSTITUTE OF PUBLIC HEALTH:** *The Harben Lectures*, 1922.—These lectures will be delivered in the Lecture Theatre of the Institute, 37, Russell-square, London, W.C., by Prof. Theodore Madsen, M.D., Director of the State Serum Institute, Copenhagen, at 5 P.M., on the following dates: Dec. 1st, Specific and Unspecific Antitoxin Production; Dec. 4th, Antitoxic Treatment; Dec. 5th, the Influence of Temperature on Antigen and Antibodies. All interested are invited to attend.

**MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.**—The next quarterly meeting of the Association will take place on Nov. 23rd at Bethlem Royal Hospital, Lambeth, London, S.E., at 2.45 P.M., under the presidency of Prof. G. M. Robertson, who will read a paper entitled the Discovery of General Paralysis: From Haslam to Bayle (1798–1822). Dr. E. W. Scripture will read a paper entitled the Treatment of General Paralysis by Malaria and the Use of Speech Inscriptions for Early Diagnosis.

**THE OPTICAL SOCIETY.**—A Conference and Exhibition of ophthalmic optics, spectacle frames and lens construction will be held on Nov. 30th at the Imperial College of Technology, South Kensington, London, S.W. The exhibition is not confined to those of British origin: it will consist of all apparatus, frames and lenses connected with spectacle fitting and construction. The exhibition will be open from 2 to 7 P.M. From 4.30 to 10 P.M., with an interval, papers will be read on the above subjects by ophthalmic surgeons, physicists, and members of the industry.

**SCOTTISH BOARD OF HEALTH: REPORT ON SUSPECTED FOOD POISONING.**—The Board have received from Mr. Bruce White, B.Sc., of the Pathology Department of Bristol University, the report on his examination of the materials sent to him in connexion with the case of suspected food poisoning that occurred at Rosewell, Midlothian, in September last. It will be remembered that three children of a farm labourer were affected in this outbreak and that the youngest child, a girl aged 3 years 10 months, died, the suspected cause of the illness being tinned pears. The materials sent to Bristol were subjected to exhaustive bacteriological examination, but the evidence was strongly against the presence of direct bacterial infection. This finding, however, does not preclude the possibility of the illness being due to the activity of bacterial toxins.

**FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.**—At the last meeting of the General Council of the Fellowship of Medicine and P.G.M.A. the new Executive Committee was elected and the policy before them was indicated by the following resolutions, moved and seconded by Sir Dawson Williams and Sir John MacAlister respectively:—

(A) "That the Executive Committee be requested to meet at an early date in order—

(1) To give immediate consideration (*a*) to the observations of the Minister of Health in reply to the Deputation received by him on July 13th, 1922; (*b*) to the Report of the General Purposes Committee confirmed by it on April 28th, 1922.

(2) To draw up a definite scheme for the future policy of the Fellowship having regard in particular to the possibility of establishing a Post-Graduate Medical School in London in coöperation or not with existing Post-Graduate Schools, such scheme to be submitted to a meeting of the Council to be called on or before Nov. 30th."

(B) "That a summary of the observations of the Minister of Health and a copy of the Report of the General Purposes Committee (April 28th) be sent to all members of the Executive Committee with the summons to its first meeting."

Sir Dawson Williams urged the necessity of putting a definite scheme without delay before the Minister of Health, the late Minister having received a deputation and having the question of a post-graduate school for London under his consideration. A pathetic incident at the meeting was the announcement by the Chairman that the late Sir James Galloway had promised to give the first of the Fellowship Post-Graduate lectures for the winter session, and on the proposal of Sir George Makins, the President of the Fellowship, it was agreed that a letter of sympathy on the death of her husband should be sent to Lady Galloway.

ABERDEEN UNIVERSITY CLUB (LONDON).—A dinner will be held on Nov. 16th at Gatti's Restaurant, Strand, London, at 7.30 P.M. Past or present graduates (men or women) wishing to attend are asked to communicate with Dr. W. Milligan, 11, Upper Brook-street, W.

STREATFEILD RESEARCH SCHOLARSHIP. — The appointment is announced of Dr. Kenneth N. G. Bailey as the second Streatfeild Research Scholar. The subject of his research will be Infection of the Urinary Tract by Coliform Bacilli. The research will be carried out at St. Bartholomew's Hospital.

SOUTHPORT INFIRMARY. — At the bazaar held recently in aid of this infirmary £18,000 was raised, £8000 in excess of the sum originally asked for. This sum, with increased annual subscriptions and other sources of income, will greatly aid in placing the infirmary on a sound financial footing.

HARVEIAN SOCIETY.—A meeting of this Society will be held at the Town Hall, Harrow-road, Paddington, on Thursday, Nov. 16th, at 8.30 P.M., when Sir J. Thomson Walker will give an address on Problems of Prostatectomy. A discussion will follow in which the following will take part: Mr. Cyril Nitch, Dr. Roche Lynch, Mr. A. Clifford Morson, Dr. J. H. Chaldecott, Dr. Montague Smith, and Mr. John H. MacEvoy.

BRITISH MEDICAL ASSOCIATION PRIZES FOR ESSAYS BY STUDENTS.—In March, 1923, the Council of the British Medical Association will award prizes of £10 each for the best essays by a final-year medical student on the Diagnosis and Treatment of Jaundice arising from Obstruction of the Larger Bile-ducts, from each of 13 groups into which the medical schools of Great Britain and Ireland have been divided for the purpose. The essays are to be clinical in nature, to include concise notes of not less than three cases personally observed by the student, and not to exceed 5000 words. They should reach the Medical Secretary, British Medical Association, 429, Strand, London, W.C. 2, not later than Jan. 31st, 1923.

HEALTH AND EMPIRE CHRISTMAS MARKET.—On Dec. 14th, 15th, and 16th a large Christmas market, organised by the Health and Empire Committee in aid of funds for public health education, will be held at 145, Piccadilly, London, W. 1, which property has been lent by the Crown. The Countess of Shaftesbury is chairman of the organising committee. The market will be arranged in various sections, representing the farm, garden, home, store-cupboard, wardrobe, and nursery respectively. Everything at the market will be sold at current market prices. All those who are interested in public health education are invited to send useful produce that may be disposed of at the sale. Prizes will be awarded in each section for the best of various specified gifts contributed. The market offices are now open at the above address, and further particulars may be obtained from the Competitions Secretary.

BRISTOL MEDICAL SCHOOL.—Within the last few months decisions of great importance to the school have been taken. The clinical teaching and clinical fees have been handed over to the University, which has also been enriched by the gift of the library of the Bristol Medico-Chirurgical Society. The Bristol Medical School may be regarded as the foster-parent of the Bristol University College, out of which grew the University. The first prospectus of the school was issued in 1833. Lectures on medical subjects were being given in the city in 1814, and it seems probable that since the fourteenth century, when a barber-surgeons' guild was known to be in existence, there has been some systematic teaching of medicine in Bristol. The University was founded in 1877; the school then was affiliated, but not completely incorporated, with the College. In 1907 the University was formed; the management and teaching of clinical subjects, with the exception of pathology, still remained, however, in the hands of the Medical Faculty. With the decision to make over students' fees to the University, Bristol ceased to be a "proprietary" school. One problem still faces the authorities—i.e., the coöperation of the work of the two institutions, the Royal Infirmary, founded in 1734, and the General Hospital, founded in 1832, at once a source of strength, owing to the friendly rivalry between the respective staffs and students, at the same time a source of weakness in the reduplication of teaching and necessary limitations of use of the clinical material. As a remedial measure three directors of clinical studies have been appointed: Prof. F. H. Edgeworth in medicine, Prof. Hey Groves in surgery, and Prof. W. C. Swayne in obstetrics and gynæcology. The chief duties of the directors will be to coördinate and regularise the clinical instruction at the two hospitals. Further steps towards coöperation are at present under consideration.

LECTURES AT PLYMOUTH.—A course of lectures is being held at Plymouth under the auspices of the Plymouth Division of the British Medical Association. On Nov. 8th Mr. H. F. Vellacott lectured on Enlargement of the Prostate, its Pathology, Symptoms, Signs, and Treatment, and Dr. Eric Wordley gave a demonstration on Laboratory Tests for Renal Efficiency. On Nov. 15th a lecture on Early Pulmonary Tubercle, its Detection and Treatment, including the Indications for the Induction of Artificial Pneumothorax, and Demonstration thereon, will be delivered by Dr. Colin D. Lindsey, and will be followed by a demonstration of X Ray Examination of the Chest, by Dr. W. Cheyne Wilson and Mr. M. Melrose. On the 22nd Mr. G. C. F. Robinson will lecture on Chronic Abdominal Pain, its Varieties, Causes, Differential Diagnosis, and Treatment. Dr. Cheyne Wilson and Mr. Melrose will demonstrate X Ray Examination of the Digestive Tract, and Dr. Wordley Laboratory Tests for Intestinal Functions. On the 29th Dr. E. L. Fox will lecture and demonstrate on Functional Nervous Diseases, and Mr. C. Kennedy will demonstrate the Treatment of Early and Late Conditions in Acute Anterior Poliomyelitis. On Dec. 6th a lecture on Diabetes and the Modern Methods of Treatment will be given by Dr. A. Bertram Soltau, followed by a laboratory demonstration on Testing for Blood-Sugar, &c., by Dr. Wordley. The concluding lecture of the series will be delivered on Dec. 13th by Mr. H. G. Pinker on Uterine Hæmorrhage, followed by laboratory and X ray demonstrations on the Detection and Treatment of Acute Blood Diseases, by Dr. Soltau, Dr. Wordley, and Mr. Melrose. The lectures will be given at 2.30 P.M., and the fee for the course is £2 2*s*., payable to Dr. S. N. Scott, Elmleigh, Plymstock.

SHEFFIELD FIELD LABORATORIES.—On Nov. 2nd a visit of inspection was made by Sir Walter Fletcher, Secretary of the Medical Research Council, to the field laboratories of the University, which are under the direction of Prof. E. Mellanby. It will be remembered that when the provision of such an experimental field laboratory was first considered by the University the Committee of the Panel Practitioners of Sheffield most generously came forward with a donation of £1000 towards its equipment. This spontaneous gift from the medical practitioners of the district acted as a great stimulus to the University in pushing the scheme forward. The Vice-Chancellor, Sir Henry Hadow, seized the opportunity of Sir Walter Fletcher's visit to give practical evidence to the practitioners of the University's gratitude, and invited the members of the Panel Committee to be present at the inspection, and the panel practitioners in the city to attend an address given by Sir Walter Fletcher at the University.

Sir Walter Fletcher pointed out that the significance of the gift was that it came from medical men who could estimate the value of the work aimed at. He congratulated the medical profession in Sheffield on this proof of the sympathy and good feeling which exists between those engaged in general practice and those working in the laboratories. Referring to the general apathy of the nation towards scientific research, he said that the Britisher was quite willing to put down large sums to relieve individual sufferers, but lacked the imagination to put down equally large sums in order to prevent suffering in the future. A former Minister of the Crown had once said that the way to lessen suffering and disease is to "give the people better grub and less dirt." Sir Walter Fletcher pointed out that the only way to bring this about was to acquire an accurate knowledge of what is "better grub" and what is "dirt." The work now being done in the field laboratories in Sheffield and in other centres was primarily the attempt to solve the former of these questions. The whole subject of "vitamins" came under this heading, and he reminded his audiences that this work was initiated and had been largely developed by British research workers. The question "What is 'dirt'" was of equal interest. Many manual workers—for example, colliers and miners—must necessarily be surrounded during their working hours by what we know familiarly as dirt; during the war our men in the trenches were necessarily immersed in dirt night and day. Such conditions were in each case inseparable from their surroundings. But the problem of science was to know accurately what elements of such dirt were noxious and what were innocuous, and to indicate how the noxious portion could be rendered innocuous. As an example of the results of accurate knowledge obtained by laboratory investigations on the relative harmfulness of various forms of dirt, he instanced the complete prevention of typhoid fever amongst the troops in the recent war as compared with its decimating effects in the Boer war 15 years previously.

A vote of thanks was accorded to Sir Walter Fletcher on the proposal of Prof. Arthur J. Hall on behalf of the Faculty of Medicine, seconded by Dr. A. Forbes, chairman of the Panel Committee.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—The President and Fellows are holding a conversazione at the College, Pall Mall East on Tuesday evening, Nov. 21st, at 9 P.M.

LONDON (R.F.H.) SCHOOL OF MEDICINE FOR WOMEN.—The annual dinner will be held at the Holborn Restaurant, London, W.C., on Friday, Dec. 1st.

LONDON SCHOOL OF TROPICAL MEDICINE: ANNUAL DINNER.—The annual dinner of the Seamen's Hospital Society, that is, the London School of Tropical Medicine, was held at the Trocadero Restaurant on Nov. 1st, when nearly 100 members and guests sat down. Dr. Hugh S. Stannus, who presided, in proposing "The School," alluded feelingly to the loss sustained in the death of Sir Patrick Manson and by the retirement from the teaching staff of Sir James Cantlie and Prof. W. J. R. Simpson. He described the work of the School in establishing a stranglehold around the equator of the globe. Much remained to be done in tropical pathology, anthropology, and even in tropical psychology, but the London School would provide the men if the means were forthcoming. The incidence of ordinary diseases such as tuberculosis, syphilis, pneumonia, and cerebro-spinal fever among tropical peoples was a field worth further exploring. Sir Arthur Clarke, in proposing "The Guests," spoke of the School's present sound financial position and its great record of achievement, and referred to the anxiety felt by the board of management in regard to incorporation with the proposed Institute of Hygiene. Sir Arthur Robinson, who replied for the guests, said that the proposal for an Institute accepted the principle that there was room for a school of instruction and research in public health—the term to be read in the widest sense, national, imperial, and international. The magnificent gift of the Rockefeller Foundation was designed to materialise this conception, and the Government had undertaken to meet the expense of running the Institute when established. Clearly, when the Ministry of Health were considering that question they must of necessity have considered the position of the London School of Tropical Medicine and the close relationship of the new Institute to the School. Sir Havelock Charles, in proposing "The Chairman," stated that the School would be willing to be incorporated, should it receive assurance that the aspirations of staff and students would be fairly met.

MIDDLESEX HOSPITAL WAR MEMORIAL.—The war memorial at the Middlesex Hospital Medical School, in memory of those students who lost their lives in the war, was dedicated on Nov. 1st. Four stained-glass windows have been erected in the hospital chapel. In these windows four soldier martyrs are appropriately depicted—St. George, St. Alban, St. Martin of Tours, and St. Joan of Arc. The main part of the memorial is in the medical school, where memorial tablets have been placed in the old entrance hall. The common room has been panelled in oak, and a portrait of Captain John Fox-Russell, V.C., M.C., painted by Mr. Ronald Gray, placed in the central panel. The Bishop of London conducted the dedication service in the chapel, which was attended by Lord Athlone, many members of the board of governors, the chairman of the medical school, Mr. S. G. Asher; the dean of the medical school, Mr. A. E. Webb-Johnson; the chairman of the memorial committee, Mr. Comyns Berkeley; members of the staff of the hospital and school and their wives, relatives of the fallen, Sir Robert Hill, Sir John Goodwin, Colonel H. E. R. James, and a large number of past and present students. Sir Robert Hill, on behalf of past and present students, invited Sir John Goodwin to unveil the memorial tablets. He remarked on the large number of the fallen who had served in the R.A.M.C., and the conspicuous service the Directors-General of the Army Medical Service had rendered by mobilising the medical profession for war service. Sir John Goodwin made sympathetic reference to the services rendered by the students of Middlesex Hospital, and remarked that, of the 46 whose names were there inscribed, 18 had served in the Officers Training Corps previous to the war, and by the sacrifice of their leisure had been available as trained officers when war broke out. Of the 46 killed, 15 were holding commissions in the R.A.M.C. Conspicuous among these, though only an example of the gallantry shown by all, was Captain Fox-Russell, who lost his life in the campaign in Palestine, and was awarded the V.C. "for most conspicuous bravery displayed in action until he was killed. Captain Fox-Russell repeatedly went out to attend the wounded under murderous fire from snipers and machine guns, and, in many cases where no other means were at hand, carried them in himself although almost exhausted. He showed the highest possible degree of bravery and valour." Sir John Goodwin concluded by expressing admiration for the services which had been rendered, which would be a source of pride to the Middlesex Hospital Medical School for all time.

**Major Henry Dutch, M.D., has been re-elected** Councillor for the Grosvenor Ward W., Westminster City Council.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.—A meeting will be held at 11, Chandos-street, Cavendish-square, W. 1, on Nov. 24th, at 5 P.M., when DR. A. R. FRIEL will read a paper on the Ionisation Treatment of Otorrhœa. Apparatus and lantern slides will be shown and a discussion will follow. All medical practitioners interested in the subject, as well as medical officers engaged in the treatment of otorrhœa at school treatment centres, are invited to attend.

SALFORD ROYAL HOSPITAL.—At the annual meeting it was stated that during the year 30,165 patients had been treated during the year, an increase of 5000 compared with last year; over 4000 patients were visited in their homes. The deficiency on last year's accounts was nearly £7000, and a strong appeal is made for increased subscriptions to reduce the financial burden. Friends of the hospital have provided £7000 for the purchase of "Oakwood" at Irlams-o'-th'-Height, as a nurses' home, on a site which may also be utilised to provide open-air convalescent wards. A "chain-of-coins" effort raised £133 for the funds and a special appeal made some time ago brought £173.

THE Bristol Medico-Chirurgical Society's Library, founded in 1891, was transferred in the following year to a fine room, built for the purpose, in a block of buildings built to house the Medical School within the precincts of the University College. With the development of the University this room has become the Council Chamber, and the books of the library have been housed, with those of the Bristol Medical School and some from the Royal Infirmary and General Hospital, in temporary premises pending removal to a permanent library in the new University buildings now being completed. The library has been maintained almost entirely by the medical men of the neighbourhood. It contains 15,000 volumes (some of rare interest) and has been valued at over £12,000; more than a hundred current periodicals are received in exchange for the Society's journal. The library, although virtually the property of the Society, has always been available to students.

MERTHYR HOSPITAL EXTENSION.—On Oct. 26th a new wing of the Merthyr General Hospital, the gift of Mr. and Mrs. H. Seymour Berry, was declared open for use by Mr. W. Heward Bell, one of the vice-presidents of the hospital. Two years ago a serious lack of bed accommodation led the medical staff to ask the governors for an extension of the building. Mr. Berry was approached, and offered a sum of £10,000, which he afterwards extended to £12,000, for the addition of a wing in the rear of the hospital. The two new wards contain 40 beds, and each ward is supplied with kitchen, cloakroom, bathroom, and lavatory. The extension also includes eight single wards—one of which is an isolation ward—and doctors' rooms. Colonel J. Jones, president of the hospital, presided at the ceremony, and in the course of his address of thanks to Mr. and Mrs. Berry mentioned the gift of £1250 from Mr. Daniel Radcliffe for the endowment of a bed in memory of the late Major-General Lipsett, of Merthyr. Mr. Berry, in a short reply, said that people who are fortunate enough to be able to accumulate a little of this world's goods had laid upon them the solemn duty to do something for the benefit of the community, particularly in their own immediate neighbourhood. Gifts of 32 beds were secured as the result of an appeal made at the ceremony, and contributions to the total amount of £1160 were received. It was stated that the workers of the district contributed £7000 a year to the maintenance of the hospital.


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# THE PARLIAMENTARY ELECTION:
## MEDICAL CANDIDATES.

NOMINATION day on Saturday, Nov. 4th, materially strengthened the position of medical aspirants for Parliamentary suffrage. Two candidates were returned unopposed: Sir William Whitla again represents Queen's University, Belfast, and Sir George Berry occupies one of the Scottish Universities seats, along with Sir Henry Craik, whose interest in Harley-street persists, although he no longer lives there. Whatever other representatives medicine secures in the House of Commons, we now know that the Insurance Act will have keen but kindly critics, and that proposals for nationalising voluntary hospitals will not pass unchallenged. If they cannot be maintained on the old voluntary basis, Sir George Berry writes, there are other ways of making provision for them which should first be tried. Sir William Milligan, who we are glad to learn is standing for West Salford, is doing so mainly because he believes that there ought to be a larger representation of the medical profession in Parliament, and because he thinks that if elected he will be able to assist legislation so far as the health of the community is concerned. Dr. B. F. P. McDonald, who sat last session for Wallasey, informs us that he is not standing again owing to unexpected private reasons. The name of Councillor E. G. Bearcroft was inadvertently included as a medical candidate, as he was incorrectly described as a doctor in the press. Dr. H. D. Levick is, we learn, contesting West Middlesbrough, with the approval of the Central Association. The list of 31 medical candidates who come before the electors next week is, therefore, as follows:—

*Universities.*

London: Sir S. Russell-Wells (U.)
Combined English: Dr. S. C. Lawrence (Ind. U.)

*London and District.*

Bermondsey, West: Dr. Alfred Salter (Lab.)
Camberwell, North-West: Dr. H. B. Morgan (Lab.)
Hackney, Cent.: Col. Arthur Lynch (Lab.)
Islington, East: Dr. Ethel Bentham (Lab.)
Kensington, North: Dr. C. W. Hayward (L.)
Shoreditch: Rt. Hon. C. Addison (L.)
Southwark, North: Dr. L. Haden Guest (Lab.)
Walthamstow, East: Dr. H. B. Brackenbury (L.)
Wimbledon: Dr. R. O. Moon (L.)

*English Boroughs.*

Birmingham, Ladywood: Dr. R. Dunstan (Lab.)
Leicester, West: Dr. G. E. Spero (L.)
Manchester, Withington: Dr. T. Watts (U.)
Middlesbrough, West: Dr. H. D. Levick (N.L.)
Newcastle-on-Tyne, North: Dr. R. W. Simpson (L.)
Plymouth, Sutton: Dr. H. Wansey Bayly (Ind. U.)
Salford, West: Sir William Milligan (L.)
Southampton: Dr. E. H. Stancomb (Ind.)
Sunderland: Dr. V. H. Rutherford (Lab.)

*English Counties.*

Durham, Chester-le-Street: Dr. D. F. Todd (U.)
Essex, Saffron Walden: Dr. R. McNair Wilson (L.)
Hertford, St. Albans: Dr. F. E. Fremantle (U.)
Lancaster, Newton: Dr. H. B. Bates (U.)
Lindsey, Gainsborough: Dr. J. E. Molson (U.)
Surrey, Epsom: Mr. Somerville Hastings (Lab.)

*Wales.*

Carmarthen: Llanelly, Dr. J. H. Williams (Lab.)

*Scottish Burghs.*

Glasgow, Partick: Sir John Collie (N.L.)

*Scottish Counties.*

Dumfries: Dr. W. A. Chapple (L.)
Inverness, Western Isles: Dr. Donald Murray (L.)
Lanark: Capt. W. E. Elliot (U.)

The University poll is taken through the post on Nov. 15th, 16th, and 17th, the other elections taking place within the day on Wednesday, the 15th. The new Parliament meets on Friday, the 24th.

*Some More Personal Records.*

Henry B. Bates, M.B.E., L.S.A., J.P., is standing as Conservative and Unionist candidate for the Newton Division of Lancaster. All his life he has lived and laboured among the workers in his district, has studied the conditions under which they live and work, the difficulties with which they have to contend, and he claims to represent their ideals and interests. He is in favour of true social reform, but no socialism. If elected he would at all times be pleased to receive information from the medical profession on subjects affecting their welfare, as he feels that medical interests are not at present sufficiently represented in the House of Commons.

H. Wansey Bayly, *M.C.*, M.A. Camb., M.R.C.S., who is standing as Independent Unionist candidate for the Sutton Division of Plymouth, is founder and honorary secretary of the Society for Prevention of Venereal Disease, after having been officer in charge of the venereal department at St. George's Hospital.

Sir John Collie, C.M.G., M.D. Aberd., J.P. for the county of London, is standing as National Liberal candidate for the Partick Division of Glasgow, with the recommendation of both the Liberal and Unionist local associations. He initiated and presided over the first special medical board for the assessment of pensions for disabled soldiers suffering from nervous disease, founded the Neurasthenic Hospital at Golders Green, and was appointed director of neurasthenia institutions. He was for a time Director of Medical Services at the Ministry of Pensions. His knowledge of industrial diseases in relation to sickness and accident claims would be of the greatest value in the House of Commons.

F. E. Fremantle, O.B.E., M.Ch. Oxf., F.R.C.S. Eng., F.R.C.P. Lond., D.P.H., Lieut.-Col. R.A.M.C., T.D., stands again as Unionist candidate for the St. Albans Division of Hertford. On matters of health, education, and of social reform he considers the soundest policy is to coöperate in a policy of stability and retrenchment at home and abroad, with a view to getting industry on its legs, reducing unemployment to a minimum, and getting a balance in the Exchequer for reduction of taxation. During this time existing methods, for which we do not get value from for expenditure, must be revised, care being taken that this involves no interference with permanent and vital efficiency. Last session saw coördination of effort by the medical committee of the House of Commons in coöperation with medical bodies; he hopes for a larger return of wise, rather than brilliant, medical Members to the new Parliament and for a further development of medical policy and progress on these lines. No medical body, he thinks, should approach a Government department without mutual and prior exchange of views with the medical committee of the House.

Charles W. Hayward, M.D. Edin., D.P.H., Barrister-at-Law, who is standing as Liberal and Free Trade candidate for North Kensington, was in general practice in Liverpool for 30 years with an honorary appointment at the Hahnemann Hospital. From 1914–18 he was in charge of an auxiliary military hospital, and has had experience of recruiting and pensions boards as well as of school medical examination in Kensington and Islington. He regards public health as a vital subject, to be improved by coöperation and fair dealing rather than by exploitation of the medical profession, which is insufficiently represented in Parliament.

Harry D. Levick, M.D. Lond., F.R.C.S. Eng., consulting surgeon to the Guisborough Hospital, is standing as a National Liberal for the West Division of Middlesbrough with the approval of the Parliamentary Elections Committee of the British Medical Association. As a councillor of the county borough of Middlesbrough he is interested in all that affects the health of the people, especially housing, smoke abatement, and the clean milk question.

Sir William Milligan, M.D., M.Ch. Aberd., J.P., Major R.A.M.C., is standing as a United Liberal candidate for the West Salford Division. He is aurist and laryngologist to the Royal Infirmary, Manchester, President of the Manchester Medical Society, and ex-President of the Laryngological Section of the Royal Society of Medicine. He stands mainly because he believes that there ought to be a larger representation of the medical profession in Parliament, and because he thinks that if elected he will be able to assist legislation so far as the health of the community is concerned.

George Ernest Spero, L.M.S.S.A., is standing as Liberal candidate for West Leicester. He concentrates his attack on consumption caused by shortage of houses and the high price of good food.

*Views on Medical Representation.*

There is no use in disguising the fact that the medical Parliamentarian may have a hard time before him. It was the feeling of one retiring medical Member that the great need was for a few representatives of medicine who would act together in all essential matters. An impression was gained last session that Labour Members were against the doctors, and for this reason, if for no other, we may hope that one or more medical men will be returned to Parliament to represent the Labour Party. Another retiring Member was of opinion that the position of the medical Parliamentarian was stronger if he gave his services freely and independently, paid his own way, and recognised no one's authority to delimit his path. A third urged the medical profession to wake up and select young active Members to represent them in the House of Commons, in order to combat the socialising of an ancient and independent profession.

The question where true economy lies will certainly be a critical one for medicine in the coming session. The Labour Party has stated quite frankly that whereas Coalition stands for muddle and inefficiency in the public health services, Labour stands for the use of municipal powers to promote the health and comfort of all sections of the community. Dr. Alfred Salter, for instance, regards big changes as indispensable, for the workers will never be reconciled to going back permanently to their old conditions of poverty, insecurity, and long hours. Violence and force will, however, achieve nothing; the "revolution," he adds, must be in people's hearts and minds. Dr. E. H. Stancomb, who stands independently for national health in a constructive sense, understands thereby a mental and moral as well as a physical standard of well-being. Another medical Labour candidate, who believes in the need for fundamental change in society, nevertheless agrees that medical men, while willing to consider the interests of all concerned in a health insurance scheme, do not want State interference with their work. On the other hand, there are those who feel with Dr. F. E. Fremantle that, on matters of health and of social reform, our soundest policy is to coöperate in a policy of stability and retrenchment at home and abroad, revising existing methods from which little return is to be expected. He likens the period to the process of hibernation, which may give opportunity for recruitment of individual and corporate life and prepare for a future policy of progress on sound lines. Sir Sydney Russell-Wells believes that much can be done without increased expenditure, inasmuch as the present system of overlapping and competing local authorities leads to waste and confusion. Yet even now he would supplement existing medical benefits under the Insurance Acts by consultant, specialist, and expert pathological assistance, and in many instances hospital treatment, and he regards grants to universities for teaching and research as a sound investment and true economy.

It was perfectly evident during last session that medicine in Parliament, as outside, was a reconciling influence, cutting across political distinctions; and a number of medical candidates, including Dr. H. B. Brackenbury and Dr. C. W. Hayward, claim support of all medical men and women, irrespective of party considerations. The improvement of public health obviously cannot be safely attempted by exploitation of the medical profession, but only with their coöperation and by fair dealing with them. In regard to the tone of the contest itself, Sir William Milligan happily expressed it: "We are out to play cricket, and while the game will be hotly contested we hope to have some sport as well, and we will not forget to think well one of another."

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—To-day (Friday) a meeting will be held at the Miller General Hospital, Greenwich, at 8.45 P.M. The President, Dr. W. H. Payne, will take the chair, and Dr. Maurice Davidson will read a paper on the Diagnosis and Treatment of Certain Chronic Pulmonary Affections in Children.

# Medical Diary.

*Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.*

## SOCIETIES.

**ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.**

*MEETINGS OF SECTIONS.*

**Monday, Nov. 13th.**

WAR: at 5 P.M.
*Paper:*
Surgeon Rear-Admiral W. Bett: Venereal Disease as a War Casualty.

**Tuesday, Nov. 14th.**

THERAPEUTICS AND PHARMACOLOGY: at 4.30 P.M.
*Discussion:*
On the Physiological Effects of Light, to be opened by Sir William Bayliss, followed by Dr. Leonard Hill, Dr. C. J. Martin, and Sir Henry Gauvain.
*Short Paper:*
Dr. J. Trevan and Miss E. Boock: The Effect of Light on the Response of Frogs to Drugs.

PSYCHIATRY: at 8.30 P.M.
*Paper:*
Dr. F. L. Golla: The Basis of the Hysterical Syndrome.

**Wednesday, Nov. 15th.**

HISTORY OF MEDICINE: at 5 P.M.
*Presidential Address:* By Dr. Arnold Chaplin.
Mr. George Gask: The Medical Services of Henry V.'s Campaign of the Somme in 1415, with a Note on William Bradwardyn, Surgeon.

**Thursday, Nov. 16th.**

DERMATOLOGY: at 5 P.M. (Cases at 4.30 P.M.)

**Friday, Nov. 17th.**

OTOLOGY: at 5 P.M. (Cases at 4.45 P.M.)
*Papers* will be read by Dr. Albert A. Gray and Mr. T. B. Layton.
*Cases and specimens* will be shown.

**Friday, Nov. 17th, and Saturday, Nov 18th.**

ELECTRO-THERAPEUTICS:
*Joint Meeting with the Rontgen Society at Manchester.*

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. 1.
MONDAY, Nov. 13th.—8.30 P.M., Discussion on Pernicious Anæmia, introduced by Dr. P. N. Panton, to be followed by Dr. Arthur Ellis, Dr. A. F. Hurst, Dr. Arthur Maitland-Jones, Dr. Price-Jones, Dr. J. J. Conybeare, and others.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, W.
THURSDAY, Nov. 16th.—8.15 P.M., a Laboratory Meeting will be held at the London School of Tropical Medicine, Endsleigh-gardens, Euston-road. Demonstrations will be given by Colonel A. Alcock, Squad. Leader Whittingham, Colonel S. P. James, Dr. Manson-Bahr, Dr. A. C. Stevenson, Dr. J. G. Thomson, Mr. C. A. Hoare, and others.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE POST-GRADUATE LECTURES, 1, Wimpole-street, W.
WEDNESDAY, Nov. 15th.—8.30 P.M., Mr. W. Sampson Handley: The Diagnosis of Breast Cancer.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, Nov. 13th.—10.30 A.M., Mr. Maingot: Surgical Pathology. 12.15 P.M., Dr. Burnford: Pathological Demonstration. 4.30 P.M., Mr. Bishop Harman: Squint.
TUESDAY.—10 A.M., Dr. Paterson: Demonstration of Medical Cases. 12 noon, Mr. Sinclair: Surgical Diseases of Abdomen. 4.30 P.M., Dr. Cole: The Medico-Legal Aspects of Insanity.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12 noon, Mr. Simmonds: Demonstration of Fractures. 4.30 P.M., Mr. Donald Armour: Surgery of the Pancreas.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 12 noon, Dr. Scott Pinchin: Disease of the Heart. 4.30 P.M., Dr. William Hunter: Diagnosis and Treatment of Severe Anæmias.
FRIDAY.—11 A.M., Dr. McDougal: Electrical Department. 12.15 P.M., Dr. Burnford: Applied Pathology.
SATURDAY.—9 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. Mr. Simmonds: Orthopædics.
Daily, 10 A.M. to 6 P.M., Saturdays 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham.
WEDNESDAY, Nov. 15th.—4 P.M., Dr. Charles E. Lakin: Modern Cardiology.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.

POST-GRADUATE COURSE: OCT.–DEC., 1922.

CLINICAL LECTURES AND DEMONSTRATIONS.

MONDAY, Nov. 13th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Lecture:—Disorders of Muscle Tone in Nervous Diseases: Dr. Walshe.

TUESDAY, Nov. 14th.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Lecture:—Compression of the Spinal Cord Amenable to Surgical Treatment: Mr. Armour.

THURSDAY, Nov. 16th.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Lecture:—Cerebellar Disease: Dr. Gordon Holmes.

FRIDAY, Nov. 17th.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Clinical Lecture: Dr. Saunders.

Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.

Lecture on NEURO-OPHTHALMOLOGY (in the Lecture Theatre). WEDNESDAY, Nov. 15th.—3.30 P.M., Ocular Palsies: Mr. Leslie Paton.

N.B.—Not more than fourteen candidates can attend this Course.

Lectures on NEURO-PATHOLOGY. MONDAY, Nov. 13th.—12 noon, Poliomyelitis and Encephalitis Lethargica. THURSDAY, Nov. 16th.—Syringomyelia and Motor Neuron Disease: Dr. J. Godwin Greenfield.

The fee for the whole Course, including Mr. Paton's lectures, is £14 14s. but these Lectures may be taken separately for a fee of £6 6s. Any part of the Course may be taken separately at a special fee. Special arrangements will be made for those unable to take the whole Course. Fees should be paid to the Secretary of the Hospital at the office on entering for the Course.

C. M. HINDS HOWELL, Dean of the Medical School.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Nov. 16th.—4 P.M., Mr. Barrington Ward: Minor Surgery.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, POST-GRADUATE COURSE, Westmoreland-street, Marylebone, W.

MONDAY, Nov. 13th.—5.30 P.M., Dr. J. Strickland Goodall: Mitral Stenosis.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.

THURSDAY, Nov. 16th.—5 P.M., Dr. W. K. Sibley: Syphilis.

UNIVERSITY OF SHEFFIELD—FACULTY OF MEDICINE. Post-Graduate Lectures and Demonstrations.

TUESDAY, Nov. 14th.—3 P.M. (at the Jessop Hospital), Mr. King: Demonstration of Cases.

FRIDAY.—3 P.M. (at the Royal Hospital), Dr. Skinner: Clinical Cases. 4 P.M., Mr. Townrow: Demonstration of Cases.

MANCHESTER FRENCH HOSPITAL AND HOSPITAL FOR WOMEN, 24, Acomb-street, Whitworth Park.

THURSDAY, Nov. 16th.—4.30 P.M., Mr. A. C. Magian: Inoperable Cancer.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.

TUESDAY, Nov. 14th.—4.15 P.M., Demonstration of Medical Cases by the Hon. Physicians.

ANCOATS HOSPITAL POST-GRADUATE LECTURES.

THURSDAY, Nov. 16th.—4.30 P.M., Mr. F. Holt Diggle: Treatment of some Common Affections of the Ear.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

Lectures on Maternity, Child Welfare, and School Hygiene.

WEDNESDAY, Nov. 15th.—4 P.M., Dr. Eric Pritchard: The Scientific Principles Underlying Infant Feeding.

# Appointments.

GROSS, M., M.B., B.S. Lond., D.P.H., has been appointed Assistant Medical Officer of Health, County of West Suffolk.

HILLS, H. W., B.S., M.D. Lond., Certifying Surgeon under the Factory and Workshop Acts for Stroud, Gloucester.

JOHNSTONE, MARGUERITE, M.B., Ch.B. Vict., Resident Medical Officer, Manchester Babies Hospital.

REID, D. McK., M.D., Ch.B., F.R.F.P. & S. Glasg., Medical Superintendent, Exeter Mental Hospital.

RUSSELL, J., M.B., Ch.B., Junior Assistant Medical Officer, Stirling District Asylum.

WIGLEY, J. E. M., M.B. Melb., M.R.C.P., Physician to the Skin Department, Paddington Green Children's Hospital.

# Vacancies.

*For further information refer to the advertisement columns.*

*Barnet, Wellhouse Hospital.*—Res. M.O. £350.

*Belfast County Borough.*—School M.O. £750.

*Brighton County Borough Sanatorium.*—Res. M.O. £350.

*Bristol Eye Hospital.*—Hon. Asst. Surg.

*Bristol General Hospital.*—Hon. Anæsth.

*Bury Infirmary.*—Jun. H.S. £150.

*Cancer Hospital, Fulham-road, S.W.*—Asst. Surg.

*Doncaster Royal Infirmary and Dispensary.*—Sen. and Jun. H.S.'s. £220 and £175 respectively.

*Dreadnought Hospital, Greenwich, S.E.*—H.S. £150.

*Dudley, Guest Hospital.*—Res. M.O. £200.

*Glasgow, Hawkhead Asylum, Cardonald.*—Jun. Asst. M.O. £275.

*Great Yarmouth Hospital.*—H.S. £150.

*Harefield, Middlesex, County Tuberculosis Sanatorium.*—Third Asst. Res. M.O. £400.

*Hospital for Consumption and Diseases of Chest, Brompton, S.W.*—Physician.

*Huddersfield.*—School M.O. £500.

*Isle of Man Central Education Authority.*—School M.O. £700.

*King Edward VII. Sanatorium, Midhurst, Sussex.*—Second Asst. M.O. £250.

*Leamington Spa, Warneford, Leamington, &c., General Hospital.*—Res. H.S. £150.

*London Homœopathic Hospital, Great Ormond-street, W.C.*—Pathologist. £200.

*London Jewish Hospital, Stepney Green, E.*—Res. M.O. and Jun. Res. M. and Cas. O. £150 and £100 respectively.

*London Lock Hospital, 91, Dean-street, W.*—Clin. Assts.

*Manchester, Eccles and Patricroft Hospital.*—Res. H.S. £200.

*Manchester, Monsall Fever Hospital.*—Third Asst. M.O. £250.

*Manchester Royal Infirmary.*—Anæsth. £50. Asst. Surg. O. £35.

*Manchester, St. Mary's Hospitals for Women and Children.*—H.S's. £100.

*Metropolitan Ear Nose, and Throat Hospital, 2, Fitzroy-square, W.*—Anæsth.

*Newport, Mon., Royal Gwent Hospital.*—H.S. £200.

*Norwich, Norfolk and Norwich Hospital.*—Hon. Surg. to Ear, Nose, and Throat Department.

*Oxford County and City Mental Hospital, Littlemore, near Oxford.*—Second Asst. M.O. £350.

*Pietermaritzburg, S. Africa, Grey's Hospital.*—H.S. £400.

*Prince of Wales's General Hospital, Tottenham, N.*—Hon. Asst. P.

*Queen Mary's Hospital for the East End, Stratford, E.*—H.P. £150.

*Queen's Hospital for Children, Hackney-road, Bethnal Green, E.*—Asst. P. £25.

*Royal Northern Hospital, Holloway-road, N.*—Obstet. Phys.

*Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.*—H.S. £100. Also Hon. Phys. for Out-patients.

*St. Bartholomew's Hospital Medical College.*—University Chair of Anatomy. £1000.

*Samaritan Free Hospital for Women, Marylebone-road, N.W.*—Surg. Reg. £50.

*Wallasey County Borough.*—Asst. M.O.H. £700.

*Walthamstow Hospital for Infectious Diseases, Chingford.*—Res. M.O. £250.

*Westminster Hospital, Broad Sanctuary, S.W.*—Med. Reg. and Cas. M.O. £250.

*Wrexham Infirmary.*—H.S. £150.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Fowey (Cornwall), Grange-over-Sands (Lancaster).

# Births, Marriages, and Deaths.

## BIRTHS.

ARTHUR.—On Oct. 30th, at 2, St. Stephen's Avenue, West Ealing, the wife of George Arthur, M.B., of a son.

BERNARD.—On Oct. 31st, at Lower Stone-street, Maidstone, the wife of Dr. E. A. Bernard, of a son.

GEORGE.—On Oct. 28th, at Finchley-road, N.W., the wife of W. Stanley George, M.D., of a daughter.

## MARRIAGES.

BARRY—FRASER.—On Oct. 3rd, at St. Ethelbert's Church, Slough, Capt. Stephen James Barry, R.A.M.C., to Harriet Elizabeth, daughter of the late Wm. Fraser, Kincilar, Aberdeenshire, and Mrs. Fraser, Aberdeen.

MCDOUGALL—MITCHELL.—On Nov. 6th, at Marylebone Presbyterian Church, William Stewart McDougall, M.B., C.M., to Sara Helen Mitchell, daughter of the late William Mitchell, Ribigill, Sutherland.

THACKWELL—DAY.—On Nov. 1st, in Madras Cathedral, Major A. C. A. Thackwell, to Mary Day, M.B., B.S., second daughter of Donald D. Day, M.B., F.R.C.S., and Mrs. Day.

## DEATHS.

BECK.—On Oct. 30th, at Bromyard, Edward Ashton Anthony Beck, M.A., M.B., aged 45.

BURD.—On Nov. 2nd, at Carnarvon House, Swanage, Edward Lycett Burd, M.D., formerly of Castle House, Shrewsbury.

DONALDSON.—On Oct. 19th, at Ringwood, Tom Campbell Donaldson, M.D., late of the Elms, Harlington, Middlesex, aged 59.

PARRY.—On Nov. 3rd, at Rock House, Ferndale, Glamorgan, Thomas W. Parry, M.R.C.S., L.R.C.P., J.P., aged 74.

ROBERTS.—On Nov. 4th, at Ruabon, Denbighshire, Richard Lawton Roberts, M.D., D.P.H., aged 76.

*N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

# Notes, Short Comments, and Answers to Correspondents.

## THE UNITY OF THE HUMAN BODY.*

BY SIR WILLIAM BAYLISS, F.R.S.

IN a well-known passage St. Paul points out that, although consisting of many members, yet the body is one, and further that those members "which seem to be more feeble are necessary"; also "whether one member suffer, all the members suffer with it." It may, I think, be said to be the characteristic of modern outlook in physiology that this problem of the interrelation and coördination of the separate organs has become its chief aim and object. We no longer find the functions of the liver or of the pancreas discussed in compartments distinct from those of other parts of the body, but rather the share taken by each in the carrying out of a complex process, such, for example, that of the utilisation of carbohydrate. Thus the mode of treatment has become one of processes which concern the whole body. The subdivisions, so far as they can be discussed separately, are not so much distinct organs as a series of connected activities of a number of mutually dependent tissues.

Claude Bernard clearly had this aspect in mind. In the courses of instruction, which he gave as professor of general physiology, we find that he treated the subject-matter under such wide and comprehensive headings as nutrition, combustion, irritability, respiration, and so on. In more recent times Dr. J. S. Haldane has emphasised the necessity of regarding living beings as organised wholes.

### *How Sugar is Burnt in the Body.*

As an illustration, let us take the case of the way in which sugar is dealt with. To begin with, we note the significant fact that what happens to sugar in a living organism is that it is finally burned with the formation of the same products (carbon dioxide and water) as if we burned it in an ordinary fire. At the same time, it gives out heat. Heat is one form of energy, and if our fuel is burned in relation with certain mechanisms, as in muscle, we find that part of the energy given out is converted into useful mechanical work, just as is the case when fuel is burned in the cylinder of an internal combustion engine. The sources of sugar in our food are not fitted for direct use by the tissue cells in this way, and it is the function of some of the digestive processes to make them available. Heavy mineral oils are not capable of use in the ordinary petrol motor, but can be partially changed by a "cracking" process into products which are sufficiently volatile to be used. Moreover, we need a store for the muscles to draw upon in the intervals between the taking of food. This is provided by the liver, although the muscles themselves can store a certain amount. The store in the liver can be released by the agency of a chemical substance (adrenalin) set free from the suprarenal bodies when they are acted on by the nerves which go to them. Further, it appears that the sugar carried to the body generally in the blood cannot be properly or completely burned unless there is also present a "chemical messenger" formed in a special set of cells contained in the pancreas. Then, again, oxygen must be supplied by the blood and the products of combustion be got rid of. This requires the lungs to bring fresh air into contact with the blood and to ensure greater ventilation in proportion to the amount of work done. This adjustment is provided by the sensibility to carbon dioxide of a part of the brain which controls the action of the nerves to the muscles which work the respiratory pump. A further complication is to be added in that the utilisation of other kinds of food—fats or proteins—is linked with that of carbohydrate. If sugar is not burned, these other substances are only incompletely made use of, and it may be that the whole process is a mutually dependent one. Thus, the coöperation of the nervous system, the intestines, liver, pancreas, suprarenals, muscles, lungs, and other organs is necessary for the fulfilment of the destiny of carbohydrates.

To look at the matter from a rather different aspect—that of the means by which the mutual coördination of these many factors is carried out—we see that there are two main methods by which the various parts of the body are put into communication with one another. These are by nervous messages on the one hand and by chemical agents on the other hand. These two coincide with the nervous system and the circulating blood. The chemical mechanism on its part may be said to consist of two different kinds of arrangements, as we shall see later.

* A lecture given at the City Y.M.C.A. on Oct. 30th, 1922.

### *The Nervous Control of Body Functions.*

Taking the nervous system first, we note that nervous channels pass from the various parts of the body to the brain, giving information of what is happening there, while there are other nervous channels which send messages from the brain to organs which enter into activity when they receive these orders. Such "effector" organs, as they may be called, are chiefly muscular in nature, both those which move the bony parts of the skeleton and those which control the dimensions of the blood-vessels, the movements of the intestines, and so on. But there are also glands which secrete digestive juices, and in some cases the "chemical messengers" to be spoken of presently.

The central nervous system has often been compared to a telephone exchange, in that any subscriber can be put into connexion with any other subscriber. We may note that the nerves themselves are merely conducting channels, and that the impulses conveyed by them are all of the same kind, just as the telephone wires and the electrical currents they carry are all of the same nature in the cases of different subscribers. Thus the effects produced in both the telephone and the nerves of the body depend merely on the different kinds of structures at the ends of the wires or nerves. The comparison is more apt than might appear on the surface, since nervous impulses are most probably essentially of an electrical nature.

### *The Chemical Method of Coördination.*

Turning to the chemical method of coördination, we note, in the first place, that the supply of food and of oxygen to all parts of the body is carried on by the blood. Absorbed by the blood-vessels of the alimentary canal, the food materials reach the places where they are needed, some of them after further chemical treatment on the way. This process may be compared to the supply of coal in carts; or more accurately to that of water or gas in pipes. It will be observed that we are dealing here with the transport of material bodies which are themselves made use of to supply energy, or to enable growth, or replacement of worn-out cells. But it will be remembered that there is also another system at work in a town. This is the postal system. This differs from the telephone system in that actual material bodies, "letters," are conveyed from place to place, but these letters are sent in order to fulfil the same purpose as messages by telephone or telegraph, not for the purpose of consumption as fuel. A supply of goods is ordered or some other process set into operation. Now there are material substances made in one part of the body and carried by the blood to other parts, where they sooner or later meet with a tissue which is sensitive to them and reacts by some change. They are present only in extraordinarily minute quantities, far too small to be of use other than as messengers. Letters, although they pass many houses, are only received at the address to which they are directed. The most appropriate name for the substances in question is "chemical messengers," but they are also known by the shorter name of "hormones," and also as "internal secretions."

It has been suggested that each of the various tissues of the body gives off its characteristic "messenger" capable of influence elsewhere, but this is at present hypothetical, and we have definite knowledge of a number of organs or tissues which can be shown in different ways to produce chemical messengers and for the most part have no other function. In only two of these, the thyroid and the suprarenal bodies, do we know the chemical nature of the substances produced. In the latter case it has been found possible to prepare the active agent by chemical means. In most of the other cases we find that administration of the tissue itself or of extracts of the tissue is able to replace the function of this tissue when it has been lost by disease or removal.

The mode in which the pancreas is excited to activity when required in digestion is of interest. When the acid contents of the stomach pass on into the beginning of the intestine, a chemical product, called for convenience "secretin," is formed by the action of the acid on the mucous membrane of the intestine and diffuses into the blood, finally reaching the pancreas, whose cells are excited to activity by it. As far as can be made out, this hormone has no effect on other organs except the liver.

### *Insulin.*

As already mentioned incidentally, there is another kind of tissue in the pancreas known as the "islets of Langerhans." Experiments have shown that the integrity of these structures is essential for the utilisation of sugar, but the evidence rested chiefly on the effects of removal and the prevention of these effects by previous transplantation of a small portion of the pancreas to another part of the body. Extracts of the pancreas were only occasionally found to be somewhat active in restoring the capability of the body tissues to burn sugar, when this capacity had been destroyed by previous removal of the whole pancreas. Recently[1] Dr.

[1] See leading article, THE LANCET, August 19th, p. 398.

F. G. Banting, together with a group of workers in Prof. J. J. R. MacLeod's laboratory at Toronto, have succeeded in preparing active extracts by several methods. These extracts, after preliminary test on other animals, have been found to be effective in man. There are difficulties, not yet completely overcome, in the satisfactory preparation of "insulin," as it has been called, while the effect of a single hypodermic injection does not last for more than about 12 hours. But there is no doubt that these difficulties will be overcome by further investigation, and it is a great step forward to be able to abolish the state of diabetes even temporarily.

There are some products of the normal activity of all tissues whose existence is not specially connected with the purpose of setting other organs into activity. They would, indeed, always be formed, whether any part of the body was sensitive to them or not. Carbon dioxide is one of these. But, as we have seen, a particular group of cells in the brain has developed a special sensitiveness to this compound, so that the respiratory pump is set into greater activity and the blood freed from excess of the dissolved gas. In a certain sense we may therefore call carbon dioxide a "chemical messenger," although this is a secondary property of it. Perhaps a somewhat trivial illustration may make the matter clearer. Suppose that a train is carrying soldiers to a port for foreign service. On its way it picks up more soldiers at the stations where it stops. Further, suppose that a nursemaid who greatly admires soldiers happens to be on the platform of some station through which the train passes. She will naturally be excited at the sight of the soldiers, although this is not the purpose of their existence. The soldiers are like carbon dioxide; the train is the blood; the stations, the various organs of the body; the port is the lungs leading to the outer air; while the nursemaid is that region of the brain sensitive to carbon dioxide, called the "respiratory centre."

The effects of sunlight in curing certain diseased conditions, such as tubercle and rickets, have recently excited interest. From the facts that exposure of any part of the skin to the rays is effective and that it is unnecessary to expose a tuberculous joint itself indicate that some "chemical messenger" has been produced in the skin by a photochemical reaction and carried by the blood all over the body. The problems involved are as yet obscure, but investigations are being undertaken.

*Vitamins.*

Again, those constituents of food called "vitamins" are obviously a kind of chemical messengers, but it appears that the animal body is unable to produce them for itself. They are obtained from the plant and are particularly abundant in fresh green vegetables and fruit. A word of warning is required against those advertisements of preparations which speak of vitamins as if they were a species of drugs. They are normal constituents of certain foods, and careful tests have shown that as much is to be obtained from an egg or an orange as from some ten shillings' worth of the best commercial product. Their precise mode of action is still unknown; but in their absence normal growth and function is impossible and certain diseases make their appearance. Thus, of the three generally recognised, vitamin A is necessary to prevent rickets; vitamin B to prevent beri-beri; vitamin C to prevent scurvy. It will be remembered that Captain Cook, in the *Resolution*, found that the eating of fresh green vegetables whenever obtainable prevented the development of scurvy in his crew.

*The Functions of the Organs of Special Senses.*

In conclusion, a few words may be said as to the function of those organs which we call those of "special sense"—the eye, the ear, organs of touch in the skin, and so on. These give us information of what is going on in the outer world. It is found that any kind of stimulation of the nerve which passes from any one of these organs to the brain gives the sensation peculiar to that organ, whether the organ is itself present or not. Since all nerve impulses are themselves alike, the fact just stated means that when that particular part of the brain to which the optic nerve, for example, passes is set into activity, we have a sensation of light. How this happens is a mystery, and we leave the realm of physiology at this point. But we see that all that is required physiologically is some mechanism in the sense organ by which a process capable of stimulating the nerve fibres is set going by the incidence of the external energy. In the retina, light induces a photochemical reaction. In the ear, sound waves set into vibration a resonating membrane, whose movements by a kind of lever-mechanism press upon the nerve endings of the auditory nerve, and so on. The essential point is that the peripheral organ should be capable of response to a particular set of external impressions, which, by itself, would be powerless to affect the nerve fibres when acting directly upon them. Thus the mechanism is of quite a different nature according to that of the external influence, whether light, heat, sound, pressure, taste, or otherwise. The sensation of pain, however, appears to need only the nerve endings themselves. These would not be sensitive to very small forces, such as those which are magnified in the organs of special sense. And, indeed, it would not be to the benefit of the organism if they were sensitive to unimportant actions upon them. When they are actually stimulated, the reaction is usually a violent one.

## NATIONAL RAT WEEK.

THE present week was fixed by the Ministry of Agriculture for a systematic campaign against rats.

*The Holborn Meeting.*

On Nov. 6th a conference on rat repression, convened by the Holborn Corporation, was held at the Municipal Offices, High Holborn, being attended by representatives of over 100 local authorities. The Mayor of Holborn was in the chair, Mr. E. C. Read, technical adviser of the Ministry of Agriculture, opened the discussion, and expressed his satisfaction that the Ministry of Health had taken over the administration of the Rats and Mice Destruction Act in the ports. The work of rat destruction in urban areas, he said, must begin in the sewers; local authorities should organise a unified scheme for this purpose. Public opinion in England was not yet educated up to the point of making extermination possible. Many diseases would in time be found to be attributable to the presence of rats and mice in human habitations. All London boroughs bordering on the Thames should employ whole-time rat-catchers. He emphasised the danger of the indiscriminate use of viruses, and recommended the squill preparations as the safest remedies where animals were kept. Sir Frederick Andrewes spoke of the danger of certain viruses in urban districts, and named barium carbonate, red squills, and phosphorus as the most efficacious forms of poison. Dr. F. J. Allan (M.O.H., Westminster) and Dr. G. Millson (M.O.H., Southwark) supported the proposal for the appointment of rat inspectors. Dr. Millson suggested that these inspectors might work under the direction of whole-time sanitary inspectors. Dr. W. M. Willoughby, medical officer to the Port of London, emphasised the necessity of rat-proof food supplies. A member of the Incorporated Vermin Repression Society spoke in favour of the registration of rat-catchers, so that only experts should be employed in the work.

*The St. Pancras Meeting.*

A public meeting and conference convened by the St. Pancras Borough Council was held at the Town Hall, Pancras-road, London, N.W. 1, in the evening (8 P.M.) of the same day, the Mayor of St. Pancras presiding, and representatives of the Ministry of Agriculture, the War Office, and various Metropolitan Boroughs being present, as well as the officers of the Incorporated Vermin Repression Society, who had coöperated with the borough council in organising the meeting. In opening the meeting, the Mayor said that the subject of rat repression was not one in which the general public were much interested, and invited Mr. T. Mark Hovell to give an address on the relative advantages of the various modes of destroying rats by traps and poisons. Mr. Hovell advocated the use of the bag trap and of the No. 5 rabbit trap, and especially laid stress on the importance of continuing always to keep traps set on premises likely to be infested, instead of taking no further action after the rats had been destroyed. Unless such action were taken re-infestation generally occurred. Mr. E. C. Read, having spoken of the interest of the Ministry of Agriculture in the matter, Lord Aberconway, President of the Incorporated Vermin Repression Society, moved a resolution of appreciation of the action of the St. Pancras Council in calling the meeting and in favour of putting the coöperation involved upon a permanent basis by the calling of a conference annually in National Rat Week. The resolution was seconded by Lieutenant A. E. Moore and was passed nem. con. Dr. T. Shadick Higgins (M.O.H., St. Pancras) dealt with the problem in relation to sewer rats as affecting houses and buildings in large towns, and said that there the line of action consisted chiefly in rendering the premises rat-proof and so confining the rats to the sewers. Attention to defective drains and sewers was of the first importance in this connexion, and much good work had been done in this way by sanitary authorities for many years. It was also important to keep food refuse in rat-proof receptacles. If there were no food available the rats would not be attracted and would not multiply. He urged that the rat-proofing of buildings should be the duty of owners and not of occupiers, and that the Rats Act was faulty in this respect. Dr. Charles Porter (M.O.H., St. Marylebone) said that there were few public health matters that had received greater attention from sanitary authorities. He was in favour of the holding of annual conferences, but felt that they should be called by public authorities rather than by any voluntary organisation.

## ACTION ARISING OUT OF CONFINEMENT IN A MENTAL WARD.

A WOMAN recently brought an action for damages for alleged slander and libel contained in communications made verbally by the defendant to a medical man, and in a telegram to the plaintiff's son. As a result of the communications so made the plaintiff was confined in a mental ward at Edmonton Workhouse, where, she stated, she was confined for 16 days. The jury found a verdict for the defendant, for whom judgment was entered. With regard to the law governing the alleged slander, Mr. Justice Salter made the following observations. A question had arisen as to an allegation of suicidal tendencies, but he pointed out that the statement involved referred to a threat to commit suicide, not to an attempt to do so. The statement that the plaintiff had so threatened was not actionable as a slander unless it were proved that "special damage" had resulted from it. It was claimed that the detention constituted such special damage, but it had been laid down by the Court of Appeal that the mere giving of a certificate by a doctor or by a relieving officer under Section 20 of the Lunacy Act, 1890, could not of itself cause detention. Nothing but the giving of a certificate was suggested as a result of the alleged slander, and therefore there was no evidence of special damage. With reference to the question of malice in respect of the words spoken to the medical man, and of the telegram, his direction to the jury would be that if the defendant honestly believed these statements to be true, they were privileged on account of the circumstances in which they were made.

## CONFERENCE OF CREMATION AUTHORITIES.

UNDER the auspices of the Cremation Society of England a conference of cremation authorities was held at the Guildhall, London, E.C., on Oct. 26th. Sir Malcolm Morris, who occupied the chair, said that he had been in the medical profession for 52 years and devoted a large amount of that time to sanitary measures for the living; he was now taking an interest in how to dispose of the dead because of the benefit to the living. The common method of disposing of the dead by burial was not calculated to benefit but to injure the living. If the present system of burying were continued, in 15 or 20 years' time the problem of finding the necessary land would be a serious one. An important point retarding the popularisation of cremation was the fee payable to the doctor or medical officer of health, certifying on Form C. Many poor people could not afford to pay the fee of the extra doctor which was necessary under the existing Act.

Dr. Chalmers Mitchell, F.R.S., said that the space occupied by cemeteries, to the exclusion of dwelling houses, as revealed by an aeroplane flight made over London, was calamitous.

Discussing the question as to whether cremation helped to conceal crime, as was universally stated, Sir William Willcox criticised the present system of granting death certificates as an insufficient safeguard. The present system was an extremely lax one. Death certificates were sometimes filled up in a casual manner, and before the doctor had satisfied himself as to the fact of death. Numerous instances had occurred in which certificates were granted before the persons were dead. The records of notable crimes which would not have been discovered but for some fact brought to light after burial illustrated the weakness of the death certificate system. If it were adequately revised there would not be so many exhumations as at present and concealment of crime would be impossible. Medical practitioners should not fill in certificates without an examination of the body, and in each case there should be a consultation with other doctors. It was obvious that cremation would remove all traces of such poisons as arsenic, hyoscine, or strychnine, but the possibility of concealment of crime was largely guarded against by the formalities that had to be observed before cremation could take place. Two death certificates had to be given, one by an ordinary practitioner and one by a specialist. Regarding the question of fees, most medical practitioners would not fill in a certificate without examination of the body, and therefore he thought that the fee should be the ordinary consultation fee. The action of certain public authorities in providing for the filling in of Form C without charge was a very important step and would help to remove one of the greatest difficulties as regarded cremation.

Dr. H. T. Herring said that since the Cremation Act of 1902, up to the end of 1921, 22,047 persons had been cremated in Great Britain. Of that number the certificates of nearly 12,000 had come before him as medical referee to the London Cremation Company. The certificate in Form C was in the majority of cases quite straightforward, and he had never heard any complaints. In order to meet the complaints as to high fees, he thought it might be well to adopt a plan such as the London Crematorium Company had adopted. A slip was attached to Certificate C stating that the medical referee to the crematorium in which the body was to be cremated would willingly fill in Form C, for a stated fee, or, on the other hand, that the medical officer of health would do it for nothing. Another way was for the cremation authority in the district to appoint certain men within their radius to perform the duty for a stated fee, and to publish their names.

It was decided to keep the conference in existence to meet as might be determined.

## THE PROTECTED AMERICAN HOME.

A RECENT article in the *Bulletin* of the Chicago School of Sanitary Instruction records the increasing ingenuity in heating arrangements designed for keeping the American home at a standard temperature. A properly working oil-heating plant with thermostatic control is able, so it is said, automatically to maintain an even temperature at any desired degree. No rooms in human occupancy, except in the case of the sick, invalids, or aged persons, should, it is admitted, be kept at a temperature of more than 70° F., but for people who are in good health and properly clothed a temperature of 66°–68° F. is considered "far better." It appears that in America, as in this country, the consumption of coal for domestic heating results in the loss of countless millions of dollars every year. Unburnt coal is left in the ashes to the extent of 20 per cent., and this wilful waste augments the unpreventable escape of heat units through the draft and chimneys. British householders also would certainly welcome any reduction in the cost of necessary domestic heating, but, apart from the sick and the aged, who are expressly excepted in the American proposal, we should regard a uniform temperature of 66° to 68° F. in the dwelling as an interesting but dangerous experiment in human metabolism. Safety lies in educating the dermal organ to respond within a very large range to the demands made upon it, and a greenhouse life at home would certainly render persons who ever have to go out into the London or Manchester winter liable to risk from chills and exposure to which they were not inured. We are fortunate on this side of the Atlantic in possessing a climate which, with all its faults, has the saving grace of rendering any form of central heating unnecessary.

## INSTRUCTION IN MENTAL DISEASES TO LAY WORKERS.

AN interesting development in mental welfare work took place recently at Horton Mental Hospital, Epsom, when, by permission of the Mental Hospitals Committee of the London County Council and with the coöperation of Lieut.-Colonel J. R. Lord, medical superintendent, 19 secretaries of voluntary associations for mental welfare received a week's course of instruction in mental diseases with a view to their better equipment to deal with the borderland cases about which they were frequently consulted. Lectures were given by Colonel Lord on the following subjects:—Historical Retrospect of Insanity; the Normal and Disordered Mind; Causation of Insanity and Early Symptoms of Nervous Exhaustion; Clinical Forms of Insanity; Lunacy Law, Institution and Home Care of the Insane (including suggestions for reform). A special demonstration on clinical types was given, and the students paid visits to the wards of the hospital and attended the patients' weekly dance. In addition to the instruction at Horton, lectures were given at the offices of the Central Association for Mental Welfare by Dr. E. A. Hamilton-Pearson on Nervous and Unbalanced Children, and by Dr. W. Norwood East on Coöperation with the Work of Medical Officers of Prisons, whilst visits were paid to the Manor Institution for Mental Defectives recently opened by the L.C.C. at Epsom, and to the Ministry of Pensions Neurological Hospital at Ewell. The students also had an opportunity of discussing with the secretary of the Mental After-Care Association the possibilities of coöperation between that association and associations for mental welfare.

Although a week's course cannot obviously be looked upon as an adequate training in this branch of mental welfare work, the experiment has nevertheless fully justified itself. The students not only gained a clearer idea of the nature of insanity and of its several forms and their varying prognoses, but they were also given opportunities of realising the difficulties inherent in the problem of mental hospital administration and the impossibility of making any serious contribution to the cause of lunacy reform without a foundation of first-hand knowledge. Such opportunities have hitherto been lacking. This pioneer effort may be the forerunner of developments on a much larger scale when courses of longer duration will come to be regarded as an indispensable part of the training not only of secretaries of associations for mental welfare but of social workers in general, most of whom are at some time or other brought into contact with the problem of the unbalanced mind.